

PSYCHOLOGICAL FACTORS DIFFERENTIATING
SUBJECTS WITH RECURRENT URINARY TRACT
INFECTION OR 'URETHRAL SYNDROME'.

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NO PAGE 108 TEXT O.K.

I declare that this thesis reports my original work, that no part of it has been previously accepted or presented for the award of any degree or diploma by any university, and to the best of my knowledge no material previously published or written by another person is included, except where due acknowledgement is given.

This thesis describes original research carried out by the author in the Department of Psychology at the Australian National University during 1986 - 1987.

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ABSTRACT

This research explored psychological factors which differentiate subjects with two different types of recurrent cystitis, an inflammatory condition affecting the lower urinary tract. Some previous investigations and anecdotal evidence from medical practitioners have suggested that sufferers of non-bacterial cystitis (the urethral syndrome) may be more likely to experience higher levels of stress and emotional states such as anxiety and depression than sufferers of bacterial cystitis (urinary tract infection). Research findings have, however, been equivocal. In this thesis studies investigating connections between stress, emotional states and illness have been reviewed. The model employed relates stressors, cognitions, emotional states (eg. anxiety, anger and depression), constitutional and physiological predisposition to illness. Feedback loops may operate between all these variables.

It was hypothesised that, using a discriminant function analysis, Urethral Syndrome (US) Group subjects would have higher life event frequency, life event distress, state and trait anxiety, state and trait anger, and depression than Urinary Tract Infection (UTI) Group subjects; and that a weighted linear function of these variables would successfully allocate subjects to correct groups at a greater than chance level. It was also hypothesised that utilising a Chi-square analysis, UTI group subjects would be significantly more likely to have engaged in sexual

intercourse in the 48 hours prior to symptom onset than US group subjects.

The best discriminator variables were life event frequency, trait anxiety, life event distress, trait anger and depression scores. US group subjects had higher scores than UTI subjects for trait anxiety, life event distress, depression and state anger but lower scores for life event frequency, trait anger and state anxiety. A weighted linear function of the discriminant variables successfully allocated 87.1% of UTI subjects and 75% of US subjects to the correct group. UTI subjects were significantly more likely to have engaged in sex in the 48 hours prior to symptom appearance than US subjects.

Even though a statistical difference between the two groups was found it may be difficult to distinguish between the two groups in a clinical setting considering the small differences between the two groups' mean scores for these variables. Other psychological variables which better differentiate the two groups may need to be sought. The method utilised to obtain subjects and the diagnostic procedures used to classify subjects in their appropriate group may have biased the results.

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CHAPTER 1

URINARY TRACT DISORDERS

1.1. INTRODUCTION

Urinary tract infections (UTI) are numbered amongst the most common of all bacterial diseases (Kass, Savage, & Santamaria, 1965). UTI's may range from asymptomatic bacteriuria (when bacteria is found present in the urine but there is an absence of urinary tract disease symptomatology), to urethritis (inflammation of the urethra) and cystitis (inflammation of the bladder) to more severe kidney infection such as nephritis, pyelonephritis and even renal failure. There is still however, an inadequate comprehension of some forms of urinary tract infections and their etiology. Studies of the epidemiology of UTI's are reviewed and tabled in the Appendix.

This study will focus on lower urinary tract infections, specifically those infections which affect the bladder (cystitis) and the urethra (urethritis). Many

disorders diagnosed as cystitis by the clinician may actually not be inflammations of the bladder but of some other part of the lower urinary tract. (Logan & Cushion, 1958; Waters, 1969)

1.2. SYMPTOMATOLOGY OF CYSTITIS

The major triad of symptoms observed in the diagnosis of cystitis are:

1. Frequency of urination
2. Dysuria - difficult or painful urination
3. Suprapubic pain - lower abdominal pain or discomfort felt before during and/or after urination.

Urinalysis reveals pus cells and bacteria and there is a marked elevation of white blood cells. Abacterial cystitis is a condition in which the patient has symptoms of lower UTI however there is no obvious bladder or urethral abnormality. Pathology tests reveal some increase in white blood cells, pus cells in the urine, and the absence of significant bacterial cultures. It has a variety of synonyms and throughout this study it will be referred to as the urethral syndrome (US). Further information concerning UTI and US is tabled in the Appendix.

Brooks & Maudar (1972) considered that bacteriuria at non-significant levels in the US group may be etiologic agents for the urinary symptoms and should probably not be regarded as contaminants. However, other studies (eg. Cox, 1966) have shown that a similar percentage of females without urinary tract symptoms have non-significant

quantities of pathogenic bacteria present in the urine. The evidence for bacterial etiology is still in question.

Many references point to the possible psychological origins of this disorder, or to the implication of psychological factors in its recurrence (see chapter 2). Schmidt & Tanagho (1981), in their urodynamic study of 75 women with recurrent cystitis symptoms with no significant bacteria present, found abnormally high tensions within the voluntary urethral sphincter muscle. The spasticity and discomfort varied with the severity of the symptoms reported. They noted that "symptoms are aggravated markedly by emotional stress and lessened at times of low anxiety...Many patients tolerate stress poorly which leads to aggravation of their symptoms"(p.427). It is not possible to ascertain whether emotional tension is the cause of the symptoms from this evidence but it is clearly an aggravating factor.

1.3.THE PRESENT RESEARCH

It is the purpose of this study to investigate some of the factors implicated in the occurrence of recurrent cystitis, specifically stressful life events, the emotional states of anger, anxiety and depression, and sexual activity. The research will explore similarities and differences between two groups of cystitis sufferers, those experiencing UTI and US.

The majority of research investigating the disorder of UTI has centred on the relationship between sexual intercourse and cystitis. There has been however, no

attempt to differentiate between the two groups of UTI and US sufferers. Even though there is much evidence correlating stress and psychological factors with illness, there has been very little research exploring these factors in connection with cystitis. The research investigating connections between sex, psychological factors and cystitis is reviewed in Chapter 2. In Chapter 3 studies of stress and illness, stress and emotions, and emotions and illness will be described in order to gain an understanding of the complexity of the dynamics of social-psychological factors implicated in illness. The hypotheses under investigation in this study will then be delineated.

CHAPTER 2

SEX, PSYCHOLOGICAL FACTORS AND CYSTITIS

2.1.SEX AND URINARY TRACT INFECTION

In Kunin's (1970) study of 34 schoolgirls who had negative urine cultures before marriage, 18 acquired significant bacteriuria in the 3 months after marriage. Symptoms of UTI developed in 14 of the 18. Further evidence for the connection between sex and UTI is revealed through a study by Vosti (1975) who has shown that recurrent infections can be prevented by a single oral dose of antibiotic after sexual intercourse. An epidemiological study of bacteriuria among nuns and working women showed that the peak prevalence of UTI's in women occurs in age groups of highest sexual activity and that bacteriuria is much less common in celibate nuns than in married women (Kunin & McCormack, 1968).

Studies by Cox, Lacy, Hinman (1968), Stamey (1972) and O'Grady, Richards, McSherry, O'Farrell & Cattell (1970) suggest that the urethra of a woman with recurrent UTI's tends to be more commonly colonised with coliform bacteria and that a woman is at high risk for the development of UTI symptoms after engaging in sexual intercourse only if the appropriate bacteria are present in the region

beforehand. Research by Buckley, McGuckin & MacGregor (1978) revealed no conclusive evidence in support of the connection between sex and UTI. Nicolle, Harding, Preckasaitis & Ronald (1982) designed a study to investigate the proportion of recurrent episodes of UTI related to sex in pre-menopausal women. The comparison of recurrent UTI sufferers and healthy control subjects indicated that the experimental group were significantly more likely to experience UTI with and without symptoms during the 3 months. It is not known whether this higher incidence simply reflects a higher probability of experiencing UTI with an increased frequency of intercourse. The interpretation of the results is also difficult given the questionable validity of the dip-slide culture as a UTI diagnostic tool.

2.2.CONTRACEPTION AND UTI

The diaphragm is also thought to be implicated in the development of UTI's as a consequence of its pressure against the bladder neck when it is positioned in the vagina. It is considered that this pressure may interfere with the function of the bladder neck and result in its incomplete emptying , thereby creating a culture medium for the growth of bacteria.

Studies have reported a positive correlation between diaphragm use (Gillespie, 1984) and oral contraceptive use (Sussman, Asscher, & Waters , 1969; Takahashi & Loveland, 1974; Evans, Hennekens, Miao, Laughlin,

Chapman, Rosner, Taylor & Kass,1978) and UTI incidence. Others have found no significant correlation (Wall & Baldwin-Johnson,1984; Kunin & McCormack,1968). This research indicates the relationship between contraceptive use and UTI symptoms is not clear. None of these studies attempted to differentiate between UTI and US sufferers. Correlations between contraceptive use and UTI may also reflect other factors highly correlated with contraceptive use such as higher frequency of sexual intercourse (Westoff,1974).

The research examining the relationship between sex, contraceptive use and UTI is suggestive of a connection between the variables but not conclusive. Most of the studies suffer from methodological problems and alternative interpretations of the results cannot be ruled out. None of the studies have attempted to differentiate between UTI and US groups. It seems likely that other factors apart from sex and contraceptive use are relevant to the development and maintenance of urinary tract disorders.

2.3.PSYCHOLOGICAL ASPECTS OF CYSTITIS

An erroneous assumption of modern medicine has been the notion that microorganisms such as bacteria are etiological agents in disease rather than one of the necessary but not sufficient conditions. It has been suggested by writers such as Engel (1962) and Lipowski (1986) that "single cause formulations or even multicausal considerations when these are limited to physical factors with other factors within the host often ignored or minimised" (Pelletier,1977,p.98) are inadequate. Research into the ways in which biological,psychological and social factors play a part in the etiology, maintenance and healing or prevention of disease has taken place within the field of psychosomatic medicine.

The term 'psychosomatic' is considered to have two core connotations : 'holism' and 'psychogenesis' (Lipowski,1984). Lipowski noted that "the core postulate of the holistic viewpoint is that the notions of mind and body refer to inseparable and mutually dependent aspects of man"(p.159) and that "the human organism, or the person, invariably functions, reacts and acts as an integrated mind-body unit" (Lipowski,1986,p.12). Lipowski (1984) also stated that the term 'psychogenesis' "implies an etiologic hypothesis about the role of psychologic factors in human disease" (p.162). Many medical writers from Aristotle to Freud and Alexander (1950), have supported

the notion that emotions have an effect on physiological functions. Lipowski(1984) argues however that the view that emotions cause disease is today regarded as unproven and invalid. "Rather they are considered to be intervening variables interposed between the meaning for the individual of the information impinging upon him or her on the one hand, and somatic responses that follow, on the other"(p.166). The 'causes of disease' can be many and varied and the significance of different causative agents can also vary according to the disease and the individual concerned. It has also been pointed out by Engel (1962) cited by Lipowski(1986) that "the term 'psychosomatic disorders' is misleading since it implies 'a special class of disorders of psychogenic etiology and by inference, therefore, the absence of psychosomatic interface in other diseases'"....."Psychosocial factors are currently viewed as a class of etiologic factors whose relative contribution varies from disease to disease, and even from patient to patient suffering from the same disease. No disease however, is regarded as 'psychogenic', in the sense that psychological factors constitute either a sufficient or necessary condition for its occurrence"(p.12).

A number of researchers have explored connections between psychological factors and the urethral syndrome (Gray & Pingelton,1956;Smith,1962). It has been suggested that whereas UTI can be found to have some organic basis, with the presence of significant bacteriuria, the urethral syndrome cannot, therefore its cause must be sought

elsewhere. Anecdotal evidence from the majority of doctors contacted as part of this study also supported the notion of psychological factors being more often implicated with US than with UTI sufferers. The number of studies exploring this hypothesis is minimal and most are methodologically inadequate.

In a study of 190 women with US, Zufall(1968) found an incidence of hysterectomy and pelvic surgery which was twice that of the general population and concluded that the evidence suggested a tendency amongst sufferers of US to experience "pelvic, abdominal and nervous symptoms, for which the most likely origin may well be neurosis of the anxiety, tension, or pressure type or an hysterical somatisation of emotional problems"(p.894). Research comparing UTI, US and a control group for incidence of cervical erosion, cervicitis, uterine prolapse or vaginal discharge however uncovered no significant differences between the three groups (Brooks & Maudar,1972).

Chertok,Bourguignon,Guillon & Aboulker(1977) drew on 55 case records of US clients compiled over 18 years in an exploration of their past and present psychosocial history. They found that in 40% of cases the subjects complained of anxiety, depression or phobias. Many of the clients reported the association of symptom onset with some kind of stressful life event such as bereavement, cultural displacement, or remarriage. Marital discord was frequently described and many indicated the presence of longstanding conflictual relations

with parents and sexual difficulties. Since the interviews were not structured with a view to systematic analysis and no UTI or control group was used for comparison, the information presented is only suggestive of associations between US and psychological distress. No conclusions about causality can be drawn, or about the relative importance of psychological distress in US compared to UTI sufferers.

A more structured form of psychological assessment was utilised in research performed by Carson, Osborne & Segura (1979). They compared the MMPI (Minnesota Multiphasic Personality Inventory) scores of 56 women suffering US with the psychological profiles of 3474 female medical patients seen at the Mayo Clinic. It was found that scores on the F Scale for the US patients were significantly elevated compared with the control group. This can indicate the tendency to exaggerate symptoms and complaints. Scores for the Hypochondriasis, Hysteria and Schizophrenia scales were significantly elevated for the US group compared with the medical group. The researchers note that the typical patient with these findings uses somatisation "in order to achieve neurotic ends" and complaints referred to the back, head, abdomen or bladder reflect periods of tension and stress in some cases. These reactions might be used to escape from painful and stressful situations"(p.313). These results may indicate the disorder is not purely the consequence of some organic or pathological process, or alternately that the psychological symptoms are

a consequence of the disorder itself. The authors make no comparison of the MMPI profiles of US and UTI patients so it is not known whether these results are relevant only to US patients or to all sufferers of urinary tract disorders or inflammatory processes.

Other researchers have considered all urological disorders to be related to psychological factors (Freud, 1905; Dejerine & Gauckler, 1911, cited by Chertok, Bourguignon, Guillon & Aboulker 1977). No significant psychological differences were noted between UTI and US patients in a sample studied by Brooks & Maudar (1972). A relationship between symptoms and emotional trauma was noted in about 16% of the UTI group and 16% of the US group. More objective methods of psychological assessment need to be utilised in order to ascertain with greater accuracy the association between psychological and physiological status in these two groups.

More objective measures were employed by Rees and Farhoumand (1977) who subjected 50 women with recurrent dysuria and urinary frequency to an investigation which included documentation of general, urological, gynaecological and sexual histories. Three psychometric tests were administered : the Eysenck Personality Questionnaire (1975) which measures Extroversion/Introversion, Neuroticism, Psychoticism and includes a Lie Scale; the Morbid Anxiety Inventory (MAI) (Salkind 1973); and the Middlesex Hospital Questionnaire (Crown & Crisp, 1966) which consists of six

sub-scales: free-floating anxiety, phobic anxiety, obsessiveness, somatic concomitants of anxiety, depression and hysterical traits. The results indicated significantly greater free-floating anxiety, obsessiveness, and somatisation in the urinary tract disorder group in comparison with a group of healthy subjects and no significant differences for phobic anxiety, depression, neuroticism and psychoticism. The urinary tract disorder group had the same scores for obsessiveness and hysterical traits as a psychiatric control group. MAI scores confirmed the high level of anxiety in the urinary tract disorder group. Fourteen of the subjects in the urinary tract disorder group were identified as bacteriuric. Analysis revealed no significant differences between the bacteriuric group and the whole of the urinary tract disorder group on any measures. No comparison was made of the bacteriuric and non-bacteriuric groups on these measures. Sixty % of the subjects with urinary tract symptoms were diagnosed as clinically anxious and/or depressed on the basis of a psychiatric interview. It is likely that such psychiatric symptoms predispose to a variety of different physical conditions and that other factors must be invoked to explain the onset and recurrence of cystitis.

A study of 25 women with recurrent cystitis (6 with UTI and 19 with US) and a control group of 90 healthy women revealed a strong though non-significant trend towards higher neuroticism scores for the US group while similar

mean values for neuroticism were evident for both the UTI and control groups. The numbers of subjects used were too small to indicate the statistical significance of the results. (Heap,1976)

In summary then, opinion appears to be divided as to the relative importance of psychological and physiological factors in US and UTI and the research to date has not clarified the situation. Some researchers suggest that since no organism can be found in the US its origin must be psychological or else psychological factors must be implicated. Other researchers consider that any urological disorder may be related to psychological distress. In the next chapter I will continue with the basic theme of the psychosomatic nature of illness and explore the research investigating the relations between stress, emotion and ill health with a view to providing the background and experimental framework for the research hypotheses of this particular study.

CHAPTER 3

STRESS AND ILLNESS

3.1.1.THE STRESS CONCEPT

In the initial part of this chapter, the concept of 'stress' will be clarified and models relating stress to illness outlined.

A variety of different meanings have been attributed to 'stress' by researchers (Levine & Scotch,1970, cited by Moss,1973,p.54). Stress has been variously defined as a stimulus, an inner state, and as a response to a stimulus or situation (Dohrenwend & Dohrenwend,1974,p.1).. Appley & Trumball (1967) assert that the correct use of 'stress' is in its connotation of response and not stimulus since there is no a priori means of determining whether any given stimulus will evoke a stress response in any given individual subject (p.44). They note that the agent that produces stress is more often defined as the 'stressor'.

3.1.2.THE NON-SPECIFIC STRESS RESPONSE

The idea of systemic stress was introduced by Selye (1946) in the form of the general adaptation syndrome

(GAS). It was suggested that while different physical disorders may have unique symptoms and aspects, there is also the same general pattern of response to a wide variety of stimuli (stressors) in almost everyone.

According to Selye's model there are 3 major stages of systemic stress:

1."the alarm reaction"

This is the stage of adaptation to the stressor. "It is a process that maximises the body's ability to resist the stressor by enhancing the functioning of the organ system best able to handle it" (Moss,1973,p.29)

2."the resistance stage"

In this phase maximum adaptation can take place, resulting in symptoms either improving or disappearing. Many of the physiological signs of this second stage are the opposite of those evoked during the alarm reaction. While resistance to the specific stressors may be high, during this phase general resistance to disease may be lowered.

3."the stage of exhaustion"

Maladaptation may occur if the stressor persists and/or defense mechanisms prove ineffective. GAS may contribute to the development of diseases including kidney and cardio-vascular disorders, inflammations, allergies, nervous system and psychological disorders, cancer and diseases involving the immune system. Selye concluded that microorganisms with which we are often continuously in contact and which usually do us no harm, may cause damage if

our resistance to infection is lowered through, for example, stress.

In Selye's theory the conception of a common state of organismic arousal may well be an oversimplification. Hinkle (1973) comments that "by and large it appears that the stimulus which is adequate to produce a profound or sustained behavioural or physiological response is 'non-specific' only in rather general terms, insofar as it is based upon innate patterns that are in some way tied to alarm, aggression, depletion or sexual arousal. However for the most part, the adequate stimulus is likely to be one that has acquired an added significance which has been learned from the past experience of the individual, and the significance of the stimulus may be highly specific to that individual alone"(p.41).

3.1.3.SPECIFICITY THEORIES

In response to the oversimplification of the non-specificity theory, specificity theories of stress have been formulated (eg Alexander,1950). "Specificity theories postulate that specific psychological...(and particular constitutional, biological or social)...variables have a predictable relationship to specific physiological variables, somatic disorders or both" (Lipowski,1977,p.238). Specificity theories are therefore different to non-specificity theories such as the GAS. Both non-specific and specificity theories recognise the contribution of social and psychological variables to disease, however each theory embodies different

notions of the causal relations implicated in the instigation of disease. The view has been presented that these two theories may complement one another and enhance our capacity to predict disease and identify populations and individuals at-risk (Lipowski,1977).

Evidence that appears to indicate connection between specific stressors and specific psychological dispositions and disease does not necessarily indicate a simple etiological relationship between the variables concerned - it may simply reflect correlation. "We should revise our simplistic conceptions of etiology. It is most appropriate to conceive of it in terms of the dynamic interaction of several sets of factors, including psychosocial ones of different weight and temporal relationships that together enable the development of a given disease." (Lipowski,1977,p.239)

3.1.4.STRESSFUL LIFE EVENTS

The quantitative measurement of recent life change has enabled the study of the contribution of stress to the development of diverse illnesses in a variety of populations and groups.

Holmes & Rahe (1967) considered that a life event might be defined as stressful if it was the cause of change in the average person's usual routine and called for readjustment of some kind. Life events are considered by many to act as precipitators of disease in general. The events themselves cannot be regarded as

inherently stressful. The degree of stress experienced in response to them depends rather on a variety of factors including the meaning attributed to them, their salience to any particular person, the personality and temperament of the person experiencing them. However, it is acceptable to recognise that certain events and situations may be similarly meaningful and require change and adaptation, especially with respect to people from similar groups in the same society.

The impact of psychological factors on illness development has been investigated via personality characteristics and their role in the attribution of meaning, precipitation of emotional reaction, and choice or utilisation of coping strategies in response to life events, eg. low self-esteem may increase the likelihood of anxiety in response to life events which in turn may exacerbate or facilitate the development of stomach ulcers. Personality characteristics could influence whether stressful life events are encountered or avoided, while alternatively stressful life events could influence the development of personality.

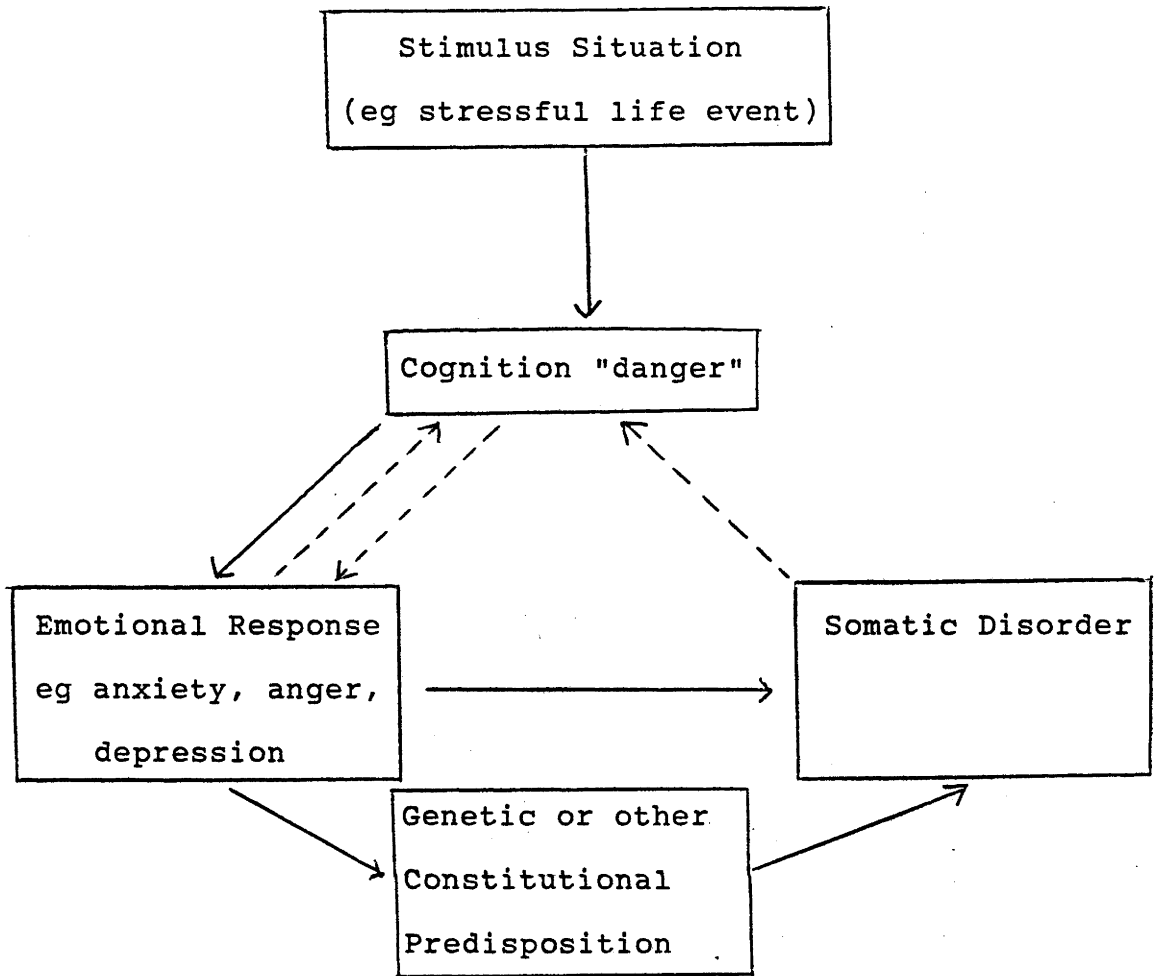


FIGURE 1 : A MODEL LINKING STRESSFUL LIFE EVENTS, EMOTIONS,
CONSTITUTIONAL PREDISPOSITION AND ILLNESS

(adapted from Figure 9.1 Beck, 1972, p.353)

In the model presented it is hypothesised that in particular psychosomatic illness, certain stimulus situations ,eg. life events, may be perceived as stressful. "The overestimation of danger and underestimation of the individual's coping capacity produces high levels of anxiety (emotional response) and autonomic arousal"(Beck, p.353). Genetic or other predispositions to physiological

responses to ANS arousal and emotional states and to illness in particular organs or organ systems are likely to facilitate the development in the susceptible individual of somatic symptoms.

Somatic symptoms and emotional response may both exacerbate danger cognitions which in turn may enhance both emotional and physiological reactions, further feeding the development of psychophysiological disorder. The model is not a perfect representation of the process connecting different factors and illness symptoms. It does not give enough recognition to the potential for each of the variables to interact and either promote or prevent disease as part of a cybernetic system with continuous feedback. It also does not recognise the influence of environmental circumstance, social support and the possibility of coping well with the stressor and maintaining health or enhancing psychological growth and well-being through mastery. It does however provide a way of conceptualising the interaction of the key variables under investigation in this research.

3.2.1. STRESSFUL LIFE EVENTS AND ILLNESS

Many researchers have reported results which indicate that stressful life events (SLE's) seem to be followed by a variety of physical and psychological disorders.

A correlation between illness (as measured by the Seriousness of Illness Rating Scale) and life event stress was found in a study of 232 subjects (Wyler, Masuda &

Holmes,1971). Cline & Chosey (1972) and Dohrenwend (1973) have revealed correlations of about .35 between subject reports of illness and life event stress measured in Life Change Units (LCU's) scored for the 6 months prior to illness. Amongst a group of navy personnel, Rahe (1975) found that the mean yearly LCU scores for those suffering either minor or major illness(es) were significantly greater than the mean LCU score for the entire group. The mean LCU score for those with major illness(es) was also significantly higher than for those with minor illness.

Not all life event studies have revealed a positive relation between SLE's and illness. Wershaw & Reinhart (1974) hypothesised that a group of newly admitted patients to a veterans' administration hospital would have life change scores that were higher in the 6 months preceding hospitalisation than in the 7 to 12 months previous. A major criterion for selection was that the subjects should have had no prior hospitalisation over the past 2 years. It was discovered however, that 19% had no life changes beyond a minimal 25 LCU's and the LCU mean score for one year prior to admission was 103. This score was much lower than those reported by researchers such as Rahe, McKean & Arthur (1967) who suggest that 164 LCU for the past 12 months is the value usually associated with serious illness. There was a statistically significant increase of 19 LCU's between 7 to 12 months and 0 to 6 months prior to hospital admission but it is questionable whether this amount may be considered clinically significant. Factors which may have contributed

to the low correlations and LCU scores may have been the age of the population and also the very small proportion of patients who had not been hospitalised in the two years prior to this admission.

Some researchers have chosen to investigate the relationship between SLE and specific illness or disability. Equivocal results have been found concerning the implication of life stress in the instigation and maintenance of high blood pressure (HBP) (Gutmann & Benson, 1971; Syme & Torfs, 1978; cited by Krantz, Grunberg & Baum, 1985). Excessive workload, job dissatisfactions and responsibilities have been found to contribute to the risk of coronary heart disease (CHD) (House, 1975). High correlations between SLE's and the exacerbation of hypertensive episodes in recurrent sufferers have been discovered (Weiner, 1979). A relationship has been revealed between increasing life change and sudden death due to cardiac disorders (Rahe & Lind, 1971) and myocardial infarction (MI) (Rahe & Paasakivi, 1971; Theorell & Rahe, 1971; and Edwards, 1971). Life history data indicates that sufferers of CHD are typically "nonadaptors" to SLE's long before the onset of illness symptoms (Lind & Theorell, 1973).

Heroin users who resumed drug abuse within a year of initially joining a methadone maintenance program were found to have experienced events involving a recent loss, depression, and exacerbation of intense affect coinciding with the recurrence of heroin use, and

significantly higher Social Readjustment Rating Scale (SRRS) scores and number of SRRS items than controls, and also had higher scores than their own steady state scores (Krueger, 1981).

Life stress may also be implicated in the early development of human cancer (Fox, 1978; Sklar & Anisman, 1981). A Psychosocial Scale was used to predict correct diagnosis of patients with undiagnosed subacute or chronic pulmonary X-ray lesions (Horne & Picard, 1979). The Scale correctly predicted benign health status for 80% of 66 patients and lung cancer for 61% of 44 patients with that disorder. Psychosocial factors were 1 to 2 times as important as smoking history in the prediction of cancer diagnosis. In a study investigating connections between life events and cancer of the cervix, no differences were discovered between cervical cancer patients and controls for stressful life events including death, divorce, illness, economic want, residential mobility and feelings of upset in the 5 year period prior to illness diagnosis (Graham, Snell, Graham, & Ford, 1971).

3.2.2.SOURCES OF INVALIDITY IN LIFE EVENT DATA

Many of the studies exploring the association between life events and illness have been criticised for the retrospectivity of data. According to Brown & Birley (1973) there are three major sources of invalidity associated with retrospective studies:

1. Direct contamination

Retrospective reporting of SLE's may result in past events being exaggerated in order to justify subsequent illness. This phenomenon is known as the "effort after meaning". The knowledge that one is ill may affect one's emotional state, and perceptions and emotions may be affected by the presence of a disease even before it has been diagnosed or symptoms are evident. It is therefore very difficult to ascertain whether or not SLE's are a consequence of these changes and therefore not necessarily etiologically related to disease symptoms. Any significant correlation between SLE's and illness cannot therefore be considered a causal connection and also illness cannot be predicted from the severity of the SLE scores. SLE's may nevertheless exacerbate already existing conditions.

2. Indirect Contamination

This source of invalidity arises if measurement of SLE is affected by any factor that may influence illness, eg anger may have an impact on the measurement of life stress and it may be anger that is causally related to the illness.

3. Spuriousness

The correlation between the SLE score and illness may reflect the influence of a third variable on both of them, eg a personality trait such as high trait anxiety may lead to both a greater chance of illness and a greater tendency to experience life events as stressful.

3.2.3. PROSPECTIVE STUDIES OF THE STRESS-ILLNESS RELATIONSHIP

Prospective designs using large groups of healthy adults increase a researcher's chances of correctly interpreting the etiological impact of variables on one another and enabling the prediction of disease, but they do not guarantee it. It was discovered that people are more likely to suffer minor health changes on high stress rather than average stress days (Holmes & Holmes, 1970). It was found that streptococcal and non-streptococcal respiratory infections were four times more likely to be preceded as followed by an acute family crisis (Meyer & Haggerty, 1962 cited by Kutash & Schlesinger, 1980, p.193).

Research revealed that in a group of first year medical students 87% with high life change scores, 48% with moderate life change scores and 33% with low life change scores experienced major health changes over the 2 years following data collection (Holmes, 1970). In a study of 2500 naval officers about to go to sea, Rahe (1968) found that those with a high life change score (high risk group) over the previous 6 months consistently reported more illnesses during the follow-up period than did the low-risk group.

All of the aforementioned studies have attempted to demonstrate that SLE's lead to a decrease in overall resistance to disease and pathological processes and render a person more vulnerable to accidents and behaviours likely to be detrimental to health. While there are numerous studies favouring a significant correlation between SLE's

and illness, conclusive evidence for the hypothesised stress-illness connection is still lacking since many prospective studies have failed to support evidence in favour of SLE-illness correlations from retrospective case-control or cross-sectional studies (eg. Goldberg & Comstock, 1976).

3.2.4.LIFE STRESS INDICES

A major controversy in the SLE literature has been concerned with the method of assessing the index of life event stressfulness. In the early stages of life event research, simple frequency counts of life event impact were utilised (Rahe, 1967). It was considered that for each person each life event experienced was connected with an adaptive or coping response and that this response was similar for all individuals. This method reflects an assumption that there is no significant difference in individual and group perceptions of life event stressfulness. It was thus later proposed that the detrimental consequences of life event impact depended not only on the number of life events but on the quality and subjective importance of the incidents.

Holmes & Rahe (1967) developed the Social Readjustment Rating Scale (SRRS), in order to estimate the magnitude of stressful life events. The life event 'marriage' was given a value of 500 and acted as a rating 'anchor point' for the values ascribed to other life events. Subjects were asked to rate events in terms of readjustment, intensity and duration relative to the amount of adjustment that marriage would require. If, for example, an

event was considered to be twice as stressful as marriage it would be assigned a value of 1000. It was found that there was a high degree of consensus among subjects suggesting a "universal agreement between groups and individuals about the significance of the life events under study that transcends differences in age, sex, marital status, education, social class, religion and race (Masuda & Holmes, 1978, p. 216). Consensual weighting of life event distress enables researchers to avoid the possibility of individuals rating life events as more stressful or more evocative of readjustment than they were in reality in order to explain the presence and severity of their symptoms of illness.

Critics have however noted that some studies have indicated that the use of one set of weighting norms to a variety of cultural, ethnic and sociodemographic groups may lower the predictive accuracy of the life event-illness relationship (Thoits 1983) .

Rahe (1973) reports correlations of up to 0.89 between frequency scores and total LCU scores. In a review of 18 studies by Zimmerman (1983) it was discovered that the average correlation between weighted scores and unweighted number of events was about .94. The group derived weights had an effect in increasing the life-event illness relationship in only 3 studies (Cline & Chosey, 1972; Cooley & Keesey, 1981; Lei & Skinner, 1980) suggesting that measures of life event frequency may be an equally valid method of determining the strength

of association between life event stress and illness.

Certain assumptions underlying the scaling of life events using consensual weights have also been questioned. The assumption that the scale values are universal does not make allowance for individual or group differences. Many of the samples used to determine scale values have come from student populations and hospital personnel, and thus have not been fully representative of the general population. The validity of the results of studies of other population samples is therefore in doubt since it is not known what differences may exist in the rating of life events between these groups.

It may be however that rather than reject the use of consensual weights as an alternative to frequency scores, it is important to discriminate in which studies they might most appropriately be used. For instance in a study by Theorell cited by Rahe(1974) of subjects with CHD, their life change data were significantly different to that of control subjects only when LCU values were used. Another view is that in the light of the high correlations between weighted and unweighted LE indices "the argument for weighting will have to stem from the conceptual precision offered by weighted indices" (Shrout, 1981,p.31).

Whether or not a life event is experienced as adverse may depend upon its desirability as well as the quantity and readjustment required by it. Research by Brown & Birley,(1968); Brown &

Harris,(1978);Hudgens,(1974); Paykel, Prusoff & Uhlenhuth, (1971), has emphasised the quality rather than the quantity of LE's. "The more severe a single undesirable event, or the more undesirable events experienced, the more likely coping abilities will be overwhelmed and disorder result." (Thoits,1983,p.57).

In Brown & Harris'(1978) study the relationship between severe and non-severe life events and the onset of depression was investigated. Severity was defined in terms of undesirability. Results revealed that 4 times more severe events occurred in the group of depressed women than amongst the non-depressed group. There was no relation between non-severe events and depression. A sudden increase in the number of severe events in the three weeks prior to depression onset was experienced by the depressed group. In comparison the rate of non-severe events remained approximately the same for both groups over that period of time. Severe and undesirable life events therefore appear to play a major role in the etiology of depression, while desirable events do not. Nevertheless in retrospective and prospective studies by Rahe(1973) desirable life changes such as marriage,promotion and vacation were all found to be positively correlated with subsequent illness.

Another approach to the assessment of life event stress has been the use of subjective and idiosyncratic ratings of life event impact.

The results of 19 studies reviewed by Masuda & Holmes (1978) indicated significant differences between groups for life event frequency and perceptions of life event distress. Age, marital status, sex, socioeconomic status, ethnicity, educational level, culture, and whether or not an event had been previously experienced were variables observed to contribute to such differences. Hough, Fairbanks & Garcia (1976) also found that culture and ethnic status influences perceptions of life event magnitude. Such research emphasises the relevance of developing methods of assessing the individual impact of life stress.

A number of investigations provide data which supports the notion that the idiosyncratic weighting of life event stress increases its predictive power in relation to subsequent illness (Byrne, 1984; Lindberg, Theorell & Lind, 1975; Rubin, Gunderson, & Arthur, 1971).

Subjective ratings have been criticised for a number of reasons. The use of distressed people to subjectively rate levels of stress may confound the relationship between stress and illness symptoms. The presence of symptoms may also influence event recall. Kobasa, Maddi & Courington (1981) have expressed the view that subjective weighting reflects the combination of environmental stressors, personality characteristics, the quality of the social network, genetic predispositions, as well as the individual's subjective assessment of the impact of those SLE's. Individual ratings if they reflect coping

styles and perceptions, handicap us if we want a measure of life event stress apart from the context of the personality and social environment. Paykel & Uhlenhuth (1972) argue that the call for subjective assessments of life event stress further confuses etiological issues in life event research, since it is to be expected that idiosyncratic subjective measures will give higher correlations with subsequent illness than a standard measure .

3.2.5.SUMMARY

Even if studies show a significant correlation between the two variables of life stress and illness, often the correlations reported are very low. Small correlation coefficients are often reported which even though statistically significant account for only a very small proportion of the variance and are therefore of little clinical significance (Wershaw & Reinhart,1974). One possible reason for low correlations is "the failure to consider variables which might mediate effects of life change...it seems likely that these effects vary from person to person and are mediated by specific individual difference variables. Given the fact that individuals may be differentially affected by life changes, it may be unreasonable to expect to find strong correlates of life stress unless such variables are determined and taken into account"(Kobasa,Maddi & Courington,1981,p.205)

The life stress studies suggest that stressful events are a risk factor that increases the probability of

disease. It is however not uniformly correlated significantly with disease. This finding highlights the fallacy of simplistically viewing stress and psychological experience in etiological relationship with disease. Stress appears to be in complex interaction with personality, biology, environmental factors and the disease process.

3.3.1. STRESS AND PSYCHOLOGICAL DISTRESS

Studies exploring connections between life events and neurosis will be reviewed in this section of the thesis since prominent among the emotionally distressing symptoms of neurosis are the states of fear and anxiety. Those studies relating stress to psychological distress will also be reviewed since this is appropriate to the investigation of the relationship between psychological factors and illness in this thesis. Psychological distress may be defined as "a general state of unpleasant arousal, indicated by self reports of physiological and bodily change (eg. dizziness, shaking or sweating hands, trouble sleeping) and/or by changes in mood (poor spirits, depression, anxiety)" (Thoits, 1983, p.34).

Appley & Trumball (1967, p.124) highlighted the fact that emotions are often aroused in parallel with the physiological disturbance associated with the adaptation to change. They state that the emotions that occur with stress may be known as the contending emotions such as anger, fear and anxiety. The life stress literature has recognised the role of SLE's in the development, maintenance and

exacerbation of emotional states such as anxiety, anger and depression.

3.3.2.STRESS AND DEPRESSION

Seligman (1975) viewed depression as the effect of individuals learning an attitude of helplessness as a consequence of past failures to successfully act in response to uncontrollable events. The sense of helplessness may then contribute to the development of hopelessness and the negative self-perception and affect characteristic of depression. Some research indicates that those who are depressed are likely to differ from control groups in their subjective perception of the severity of stressors and their ability to cope (Sacco, 1982).

Any comprehension of the relationship between stress and depression is complicated by the nature of depression itself. Depression may be best differentiated into subgroups of affective illnesses on the basis of such factors as symptoms, prognosis and family history. In a retrospective study, 97 subjects categorised as suffering either unipolar or bipolar depression and 100 healthy control subjects were contrasted on SLE scores for the 3 months prior to the onset of the most recent episode and 3 months prior to the initial onset of depression. Prior to the initial illness significantly more marital and family conflicts and somatic illness were reported by patients than controls, and promotions and successes were significantly less frequent (Bidzinska,1984). These observations support

the notion that life stress can facilitate the onset of affective distress.

A correlation between relatively mild depression, a mental health index and SLE's was reported by Markush & Favero (1974). In a randomly selected sample of adults over the age of 18 years, it was found that the higher the LCU scores, the higher the depressed mood score and the higher the psychophysiological symptom score. Women scored higher on depressed mood and psychophysiological symptoms than men.

A number of researchers have found that life changes are predictive of depression and suicide (Paykel, Myers, Dienalt, Kler, Lindenthal & Pepper, 1969; Thomson & Hendrie, 1972). In the Paykel et al (1969) study, 185 depressed subjects were matched with control subjects on sex, age, marital status, race and social class. Depressed subjects reported 3 times the number of events as control subjects in the 6 months prior to illness onset. A prospective study by Paykel & Tanner (1976) reported frequent recurrence of depression after the experience of significant life change.

Other research points to the greater incidence of undesirable or dangerous events amongst the depressed (Beck & Worthen, 1972; Jacobs & Paykel, 1974) and unpleasant or aversive events (Lewinsohn & Talkington, 1979; Paykel, 1974). Life changes, depression and physiological symptoms have been significantly correlated by

Vinokur & Selzer (1975). The influence of moderator variables between SLE and depression has been reported in research by Brown, Bhrolchain & Harris (1975) who found that women who experienced severe SLE's and were without a confidante were about 10 times more likely to develop depression than were controls or those with high stress and social support .

The research correlating SLE's and depression has been criticised on a number of grounds. Many of the studies have been confounded by the retrospective nature of the reporting. It is possible that past SLE's reported by depressed subjects are primarily reflections of the subject's affective disturbance and unstable life style and the recall of their frequency may be coloured by their current physiological state. Their state of affect may encourage them to more frequently report on unpleasant events than would a healthy control group subject. Warheit (1979) who looked at the relationship between life events, coping resources and depression in a randomly chosen community sample found that "by far the best predictor of depression scores at Time 2 was Time 1 depression scores" (p.121). It may be that in many instances stressful life events provide the context in which those people prone to depression become depressed.

3.3.3.STRESS AND ANXIETY AND ANGER

Research has explored the relationship between anxiety, anger and stress. It is important to note that anger is often measured in the form of aggression, hostility and irritability, making comparisons between studies difficult since these are not the same constructs. Spielberger (1980) has differentiated them in the following way:

"Anger is generally considered to be a simpler and more fundamental concept than hostility or aggression. Whereas anger usually refers to an emotional state, the concept of hostility has the connotation of a complex set of attitudes involving angry feelings and aggressive behaviour directed toward injuring other people or destroying objects. Aggression...is often used synonymously with hostility. However a distinction is generally made between hostile and instrumental aggression. Hostile aggression is motivated by anger; instrumental aggression is directed toward removing or circumventing obstacles between an aggressor and a goal, and may not involve angry feelings."(p.1)

Irritability may be conceived as a characteristic feeling state accompanying anger. An emotional state refers to a transitory experience whereas a trait refers to a stable tendency to respond to events in a particular way.

There is general agreement amongst researchers concerning anxiety responses and their manifestation, eg. a sense of impending danger, avoidance behaviour, an experience of tension and distress, diminished ability to concentrate, impaired speech and motor coordination, increased heart rate and blood pressure, rapid breathing and increased urinary frequency.

Significant relationships between life events, physical symptoms and several measures of state and trait anxiety have been found (Reavely 1974 ;cited by

Krantz, Grunberg & Baum, 1985). In a group of psychiatric inpatients significant correlations were revealed between Holmes & Rahe's SRRS and the Manifest Anxiety Scale of the MMPI in contrast with non-significant correlations for a group of healthy controls (Dekker & Webb, 1974). Vinokur & Selzer (1975) correlated ratings of aggression, paranoid thinking, depression, suicidal proclivity, anxiety, self-reported tension and distress with 3 different approaches to scoring SLE's - life event frequency; LCU's; and respondents' self-ratings of the amount of pressure and degree of adjustment required by each life event, with the score for desirable life events subtracted from the score for undesirable events. Correlations between all scoring methods and the dependent variables were significant but highest for the undesirable event score. In a sample of patients with affective neuroses (depressive, anxiety or mixed) contrasted with a matched patient control group it was discovered that the neurotic group had experienced significantly more life events in the 3 months before illness onset than the control group. (Cooper & Sylph, 1973)

Byrne (1984) investigated correlations between life event frequency, cumulative distress scores, and idiosyncratic and subjective ratings of SLE's and symptoms of neurosis (anxiety, depression, nervousness and irritability), and found that life event measures correlate with current neurotic symptoms and prospectively with those

appearing in the near future.

A high frequency of life change in low sensation seekers has been significantly associated with increased neuroticism by Smith, Johnson & Sarason (1978) and anxiety and hostility (Johnson, Sarason & Siegel, 1979). Johnson & Sarason (1978) found the strongest correlation between negative life events and depression and anxiety for those characterised by external locus of control. (External locus of control indicates a belief that environmental reinforcers are controlled by luck, fate, chance and powerful others).

3.4.1. EMOTIONS AND ILLNESS

Emotions have been correlated with illness by many researchers. Luborsky, Docherty & Penick's (1973) review of 53 studies (both retrospective and concurrent) observing the conditions preceding psychosomatic illness found that "The same main types of psychological antecedents reported in order of frequency were resentment (hostility), frustration (rejection), depression (hopelessness), anxiety and helplessness" (p.196). Most of these studies were however retrospective and it is not possible to ascertain the impact of the disease on personality. In a prospective study Spilken & Jacobs (1971) assessed a group of healthy individuals for life change, degree of affect, distress and coping style. It was found that those who sought medical care over the next few months had a significantly higher mean score for the 4 predictors during the period before symptom

appearance than the group who did not require treatment. The highest correlation shown was between the Manifest Affect Rating Scale score and the degree of incapacity.

The association between emotional states such as anxiety, anger and depression and illness such as ulcer, cardiovascular disorders and cancer have received much anecdotal support. The research providing evidence in support of such theory is next reviewed. Much of the research which has investigated the relationship between stress, personality traits, emotional states and illness has explored Alexander's (1950) specificity hypothesis which asserted that a specific psychological conflict was associated with a specific disease. It has been suggested that this specific psychological conflict would not explain the occurrence of the disease unless other predisposing factors were present (Weiner, 1979; Rabkin & Struening, 1976). Weiner reviewed many studies exploring specific psychological conflicts associated with 7 diseases which include bronchial asthma, CHD, peptic and duodenal ulcer and ulcerative colitis. Much of the data indicated that there are more psychological similarities between patients with the 7 illnesses than there are differences. It was also noted that much of the conflict in results obtained may reflect the fact that there are often different subgroups with one disease i.e. groups that differ on possibly significant variables such as site of the ulcer or inflammatory process, age of disease onset, severity and duration of the disorder and

responsiveness to therapy (p.586-8).

3.4.2.EMOTIONS AND CHD

Aggression, hostility and anger have been related to hypertension, coronary heart disease (CHD) and CHD complications of hypertension (Diamond,1982). Epidemiological and longitudinal studies have discovered relationships between self-reports of inability to successfully handle anger and a higher resting blood pressure (Diamond,1982; Weiner,1977). The relationship between anger mismanagement and sustained hypertension has been revealed in research by Kahn, Medalie, Neufield, Russ & Goldbourt (1972) & McClelland (1979). The greatest lability of both systolic and diastolic blood pressure has been correlated with subjects' level of anxiety and hostility (Thailer,Friedman,Harshfield,Kleinet & Rokering,1982). Schwartz,Weinberger & Singer (1981) have noted that anger, of all the emotions, seems to evoke the greatest CV responses. Matthews,Glass,Rosenman & Bortner(1977) found that it was the measures which were associated specifically with competitive drive, impatience, and potential hostility that selected out coronary prone subjects. Psychological factors such as stress, anxiety and overt behaviour patterns appear to be connected with the onset of CV disorders, however the results of studies are suggestive and not conclusive (Krantz,Grunberg & Baum,1985).

Pilkowsky, Spalding, Shaw & Korner (1973) found that hypertensives were more emotional, anxious, tense, unstable, excitable, guilt-ridden timid, insecure and

sexually inhibited than healthy control group subjects. These characteristics correlated with rises in peripheral resistance and blood pressure levels. Weiner (1979) notes "the tentative conclusion can be reached that the clinical psychiatric traits and psychological states occur in some, but not in all, hypertensive patients. There is psychological heterogeneity, on the other hand there is a relationship between emotionality, excessive vascular hyperreactivity and BP variability in patients with essential and renovascular hypertension." (p.129)

Goldstein (1981) suggests that the overall lack of uniformity in the research results investigating hypertension may be the result of methodological differences and difficulties. Different types of hypertension are not always differentiated, there is no agreement as to what measure actually represents high blood pressure, some researchers utilise systolic, others diastolic readings; since BP is subject often to much variability, subjects may easily be misclassified; subjects are often from clinical populations and do not therefore constitute a random sample; and control groups are often not used in the studies cited. Longitudinal studies are also required to clarify antecedent and consequent factors in the relationship between emotions and disorder and to identify predictor variables of relevance to disease onset, recurrence, duration and severity.

3.4.3. EMOTIONS AND ASTHMA.

Much of the research exploring the antecedents of asthma attacks have revealed the possible involvement of emotional states, in both children and adults.

Rees (1956,1964) found in a sample of asthmatic children that the first episode was accompanied by psychosocial stresses (12%), infection (35%) and allergy (3%). The psychosocial stresses included the death of a parent, relative or friend; accidents; frightening events; school difficulties. The study also revealed that psychological factors were of importance in further recurrence of asthma. Purcell (1962,1963,1965) compared rapidly remitting and steroid dependent asthmatic children and found that "attacks might be precipitated by a variety of psychological and behavioural factors in interaction with allergies and respiratory infections. It was observed that in the rapidly remitting group, asthma was more likely to be associated with such emotions as anger, anxiety and depression, than in the steroid dependent group.

Sclaire(1959) studied 59 patients soon after a first asthma attack and discovered that 36/58 reported a psychologically threatening situation before the onset of the disorder. The adult asthmatics were reported as being frequently anxious, fearful and enraged preceding an attack. Wright (1965) also found that life events and emotional responses to them may increase the severity and frequency of asthma attacks . Knapp & Nemetz (1957)

connected depression during asthma attacks to antecedent loss, longing and disappointment. Knapp & Nemetz(1960) investigated the emotional response surrounding 406 episodes in 9 patients and found that 34% of the episodes were preceded by anger, general irritability, arousal, restlessness and sweating ; 10% were preceded by elation and erotic arousal and increased motor activity; and 5% by depression. Forty-five to 60 % felt depressed, helpless or hopeless during the episode.

Factors which may complicate the interpretation of the research findings included the heterogeneity of subject populations; diseases may not be single entities but rather a family of entities with different etiologies and pathogeneses; the establishment of a diagnosis is sometimes difficult; observers' findings and subjects' responses may be contaminated by prior knowledge of the subjects' disease; subject and control groups are frequently not matched for such factors as SES, age,sex,educational level, age of disease onset, and medical history.

3.4.4.EMOTIONS AND CANCER

A high frequency of loss of an important emotional relationship has been found prior to the first signs of neoplasm. Such losses are often associated with hopelessness, helplessness and depression (Le Shan,1959).

All the studies reviewed by Le Shan were retrospective and many were uncontrolled. The results cannot therefore be considered conclusive nor predictive. A prospective study by

Schmale & Ilker(1966) utilised the presence or absence of the "giving-up reaction" to predict a definitive cone biopsy following suspicious cervical cytology. Thirty-one of the forty predictions were correct. This 'blind prediction' in asymptomatic patients, makes it difficult to rationalise the results in terms of observer bias or of illness symptoms producing the emotional reaction. Greene (1966) found that depression and anxiety reactions to losses and separations were often associated with the onset of leukemia or lymphoma.

Thomas & Greenstreet (1973) found in a prospective study of 1076 subjects that the 9 who developed cancer between 11 and 27 years after initial testing had lower depression, anxiety and anger at the time of first testing than those who later suicided, or developed mental illness, hypertension or coronary heart disease, and were significantly lower on anxiety and depression than the disease-free control group. Other research into the development of cancer and its association with particular psychological characteristics has suggested that "those who develop cancer are unable to express hostile feelings and emotions (Renneker & Cutler,1952; Solomon,1969b) are depressed and withdrawn in emotional expression (Hagnell, 1966)" (Krantz, Grunberg & Baum, 1985, p.104-5).

In a group of women admitted for breast tumour biopsy and interviewed prior to determination of definitive diagnosis, both groups reported similar amounts and types of

stressors within the previous 5 years however in a significantly higher number of cancer patients, extreme suppression of anger and other feelings was discovered. Cancer patients were also found to display significantly more frequently than non-cancer subjects, extreme expression of anger, although the numbers were much smaller than for the repression of anger. (Greer & Morris, 1975).

So far the results appear to be inconsistent and the relationship between psychological factors and cancer etiology has not been conclusively supported (Fox, 1978; Le Shan, 1959)

3.5. EMOTIONS IN RESPONSE TO ILLNESS

Emotions occurring in association with physical symptoms may not always be viewed in an etiological role. Research appears to indicate that people who are physically ill are likely to react with emotional symptoms particularly with anxiety, anger and depression.

It has been found that 79% of referrals from general hospital wards to a psychiatry department have been diagnosed as reactive depressives (Ripley, 1947). Poe, Lovell & Fox (1966) reported 52% and Stewart, Drake & Winokur (1965) 20% of general hospital admissions showed symptoms of depression. The use of Beck and Hamilton depression inventories, 2 objective measures and 2 clinical ratings on the emotional status of 153 general hospital admissions revealed irritability amongst 78%, anxiety in 75% and depression in 50% (Schwab, Bialow, Clemmens & Holzer, 1966;

Schwab, Clemmens, Bialow, Duggan & Davis, 1965). It was found that many of the minor physical symptoms experienced by depressed clients i.e. fatigue, lethargy, insomnia, upper GI disturbance, recent weight loss, chest tightness or pain, tachycardia, generalised pain, libido loss, urinary disturbances such as frequency and dysuria, were experienced by the patients. Schwab et al. reported that depressives and the physically ill were only differentiated on the basis of the first 4 symptoms.

Cassidy, Flanagan, Spellman & Cohen (1957) surveyed symptoms experienced by a ward of the medically ill and a ward of manic depressives and concluded that symptoms of depression occurred with the same frequency and distribution in both groups. The researchers suggested that a diagnosis of primary depression may be equally appropriate for both groups.

In the emotional readjustment phase of an illness, particularly in disfiguring or incapacitating malignancies, anger responses were prominent and "common to patients with chronic illness" (Deitch & Shulkin, 1962, p.25).

In a study observing sufferers of psychosomatic illness and disease without psychosomatic connection equally high neuroticism scores were discovered in both groups. The scores were also higher than those for healthy subjects. Bendien (1963) suggested that the presence of neuroticism may be secondary to being ill in both groups and does not

necessarily indicate a connection between a neurotic personality type and the onset of psychosomatic illness

3.6.SUMMARY

The relationships between the variables of life stress, emotions and physical symptoms are obviously complex and interactive. A large number of highly stressful events can facilitate the development of illness; life stress and the emotions aroused can be associated with the onset of illness; and physical symptoms can evoke emotion and cause an individual to be more liable to experience stressful life events. Life event stress may arouse health promoting emotional and cognitive and behavioural responses and illness may mainly be caused by genetic predisposition. It is very likely that no simple connections between life events, emotions and physical disease can be ascertained however it appears that the onset and recurrence of certain disorders is facilitated by the experience of stressful life events and emotions such as anger, anxiety and depression.

3.7.THE HYPOTHESES

The purpose of this research is to investigate differences that exist between UTI and US subjects. More specifically, the study explores differences between the two groups in the frequency of life events, life event distress scores, anxiety, anger, and depression scores, and sexual activity in the 48 hours prior to symptom appearance. The hypotheses are that

1.US Group subjects will have higher measures of life event frequency, life event distress, state and trait anxiety, state and trait anger, and depression than UTI Group subjects.

2.A weighted linear function of these variables will successfully allocate subjects to correct groups at a greater than chance level.

3.UTI Group subjects will be significantly more likely to have engaged in sexual intercourse in the 48 hours prior to the appearance of urinary tract symptoms than US Group subjects.

METHOD

4.1.SUBJECTS

Forty-nine women suffering from recurrent cystitis participated in this study.

There are a variety of ways of defining recurrent cystitis:

- 1.Cystitis that is experienced more than once. Recurrent episodes may occur either regularly or irregularly.
- 2.Cystitis that occurs regularly after the first episode. The frequency may vary between individuals, eg. once a month or once a year.

Neu(1983) has defined recurrent cystitis as "3 or more infections in a 6 month period"(p.130). Kincaid-Smith (1971) has described recurrent infection as "more than 3 attacks in 12 months"(p.12). For the purpose of this study 'recurrent cystitis' is defined as 'at least 2 episodes per year over the last 2 years' or 'at least one episode per year over the last 5 years'. The criteria was not intended to be rigid, but simply to indicate the requirement that subjects had experienced cystitis more than once and with some frequency of recurrence.

It was not possible to acquire a random sample from the general population of recurrent cystitis sufferers. Since the number of recurrent cystitis sufferers available is relatively small, and given the amount of time available for the study, the only feasible procedure for obtaining subjects was through medical practitioners who the subjects attended for treatment. The subjects in this sample may therefore not be fully representative of all recurrent cystitis sufferers. While clinical referral is not the ideal procedure for obtaining subjects it is the normal procedure used in acquiring subjects with current symptoms requiring medical treatment.

Thirty-two of the subjects were in the UTI group and 17 subjects in the US group. The mean age for UTI group subjects was 33.5 years and the age range was 17 to 60 years. The mean age for US group subjects was 37.5 years and the age range was 22 to 58 years. Mean parity for UTI group subjects was 1.25 and for US group subjects was 1.12. Thirty-eight of the subjects were born in Australia, 6 in the UK, 2 in New Zealand, 1 in Ireland, 1 in Spain and 1 in Cyprus. Thirty-seven of the subjects were in good general health. The remaining 12 (7 from the UTI group and 5 from the US group) suffered from a variety of illnesses including epilepsy, high blood pressure, insomnia, fluid retention, stomach ulcer, hayfever, asthma, myalgic encephalitis and irritable bowel.

Women only were employed as subjects in this

study since there may be sex differences in the connection between psychological variables and the probability of experiencing either UTI or US. Women are also more likely than men to experience UTI or US between the ages of 14 and 60 years. This age group was selected for study because it was important that the subjects' symptoms were not related to structural abnormalities of the urinary tract. (Prior to age 14, the majority of urinary tract disorders are associated with structural abnormalities). Women within this age group with structural abnormalities of the urinary tract were excluded from the study since structural problems facilitate the development of UTI and their participation in the study would make difficult the study of the particular variables under investigation and their association with urinary tract disorders. Any subjects with diabetes were also excluded from the study since diabetes predisposes to UTI. Over the age of 60 years, the incidence of UTI increases in both sexes and appears to be related to the aging process. The age group chosen was therefore more appropriate for the investigation of this study's hypotheses.

4.2.1.PROCEDURE

In Canberra, A.C.T., 47 general practitioners and 4 urologists were contacted by telephone between 23/7/1986 and 13/8/1986. Forty-two general practitioners and 2 urologists agreed to assist with the research. Practitioners' practices were located in most suburbs of Canberra. Fifty-one general practitioners and 8 urologists were contacted by

telephone between 3/9/1986 and 10/9/1986 in Sydney, N.S.W.. Thirty-one general practitioners and 5 urologists agreed to help with the study. In Canberra between 11/9/1986 and 17/9/1986, 4 natural therapists were contacted by telephone. All agreed to assist with the research. An advertisement was placed in a local Canberra newspaper in the first week of September, 1986, for recurrent cystitis sufferers. Notices were also placed on an Australian National University Union building noticeboard and at the Canberra Women's Information Service, inviting women who suffered from recurrent cystitis to phone the researcher.

Further telephone calls were made to 20 general practitioners and 1 urologist in Sydney between 7/1/1987 and 21/1/1987. Seventeen of these general practitioners agreed to assist in the research. All practitioners' names and telephone numbers were found in the telephone directory. Those practitioners contacted in the Sydney region had practices throughout the Sydney suburbs. Altogether, 90 general practitioners, 7 urologists and 4 natural therapists assisted the researcher to find the appropriate subjects. Reasons given by practitioners for not participating included insufficient time, no recurrent cystitis sufferers attending their practice, and lack of interest.

All practitioners were given copies of the Cystitis Questionnaire (CQ). The number of copies given depended on the number each practitioner considered he or she would be able to distribute. Practitioners were each given

information about the study and subject selection criteria. A copy of the questionnaire and practitioner information sheet is tabled in the Appendix. Each practitioner was required to ask patients who fitted the subject criteria to participate in the study. If a patient agreed then she was given a copy of the CQ and asked to telephone the researcher for assistance in completing the CQ or for further information about the research. Subjects were also informed that if they preferred they could simply complete the CQ and mail it to the researcher without making telephone contact. Only 9 subjects actually contacted the researcher with queries about the CQ.

Practitioners were informed that the results of urinalysis were also required in order that subjects were able to be classified as members of either the UTI or US group. Practitioners were asked to provide subjects with the information from the urinalyses concerning the types and times of their 6 most recent episodes. It was requested that doctors ask women to follow routine directions for urine specimen collection to ensure no contamination of the urine sample.

When all subjects required for the study had sent in a questionnaire, the researcher contacted all practitioners by telephone or letter. Practitioners had been initially requested to keep a record of the number of patients they asked to participate in the study and the number of patients who agreed to answer a questionnaire.

This information was collected by the researcher. In the A.C.T. 78 patients were asked to participate and 43 agreed to respond to the questionnaire. In Sydney, N.S.W., 126 patients were asked to respond to the questionnaire and 95 agreed. Of the 138 patients who agreed to complete the CQ, 76 responses were received by the researcher. Twenty-one of these questionnaires were rejected because they were not answered correctly and 18 subjects could not be included in the study since they were not classifiable in either the UTI or US Group on the basis of their urinalysis results and medical history.

Doctors were routinely phoned throughout the 6 to 7 months while the experimenter was collecting data, in order to maintain their interest and attention. Doctors reported that reasons given by patients for not participating included lack of interest, concern about privacy, the length of time required to complete the questionnaire, and the level of difficulty of the questionnaire.

Practitioners raised queries about the extent to which several factors may have biased the subject sample:

1. The CQ required a certain level of education and intelligence of the respondents
2. Many migrant and non-English speaking patients were not able to participate
3. Those subjects not motivated to complete the CQ may have had particular characteristics of relevance and importance to the research.

Twelve questionnaires were returned by subjects who had heard about the research project through acquaintances of the researcher or through other women who had responded to the questionnaire

4.2.2.THE CYSTITIS QUESTIONNAIRE

The Cystitis Questionnaire consisted of a number of different sections. A copy may be found tabled in the Appendix.

The first 8 questions concerned subjects' demographic statistics: age, marital status, parity, educational level, employment status and country of birth. These questions were derived from "The Work and Cardiovascular Fitness Survey" (Byrne,1986).

A reading of the literature on urinary tract disorders suggested further questions which needed to be asked in the following areas:

Questions 1 to 6 in Section 2 required information about family history of urinary tract disorder, length of time since the first cystitis episode, the number of cystitis episode since the first attack, medical procedures undergone in relation to this disorder, other disorders affecting the urogenital area.

Section 3 included questions on the subjects' present medical status. These questions required information concerning the symptom of the present episode and previous episodes, current medical treatment, medication used for other disorders, the presence of urinary frequency apart

from that experienced during a cystitis episode, allergies and contraceptive use.

Section 4 consisted of Self Analysis Questionnaires 1 and 2 and the List of Recent Experiences (Henderson, Byrne, Duncan-Jones, 1981). Self Analysis Questionnaire 1 comprised Spielberger's (1980) State Anxiety and Anger sub-scales from the State-Trait Personality Inventory (STPI) and also the Beck Depression Inventory (1967). Self Analysis Questionnaire 2 comprised Spielberger's Trait Anxiety and Anger sub-scales from the STPI. The List of Recent Experiences is presented on pages 11 to 17 of the CQ.

The final section of the CQ included questions on sexual activity in the 48 hours prior to cystitis symptom appearance, beliefs concerning the impact of psychological factors on the development of the disorder, beliefs about the causes of the cystitis symptoms, and information about the diagnosis of the current and previous cystitis episodes. A form was included at the end of the CQ for each subject to sign, enabling the researcher to collect information about the diagnosis from the subject's doctor if they were not able to report that information themselves.

4.3.1.DEPENDENT VARIABLES

The dependent variables used in the discriminant function analysis were state and trait anxiety and anger, depression, life event frequency and distress scores.

4.3.2.STATE AND TRAIT ANXIETY

Often anxiety responses may be described as stress or tension. Tension is often used with reference to muscular tension or a vague sense of distress. Both nervous distress and muscular tension point to a possible underlying condition of anxiety. In this thesis, however, a clear distinction between anxiety and stress or tension has been drawn. A stress response may include anxiety, but it may also include other emotions such as anger and depression.

According to Levitt (1980) anxiety may express itself in at the minimum 4 different ways:

- "1. a verbal report , spoken or written, that conveys via ordinary language the message that the reporter is consciously experiencing fear
2. minor surface physical reactions such as pallor, sweating or trembling...
3. internal physiological reactions such as elevated blood pressure and pulse rate, breathing, hormonal and gastro-intestinal changes, and loss of consciousness;
4. voluntary gross motor behaviour or absence of behaviour ("freezing") most often taking the form of withdrawal from, or avoidance of, a situational threat."(p.66)

An operational definition of the hypothetical construct, anxiety, is achieved through the design and experimental use of an instrument which measures anxiety. A number of different measurement techniques have been

employed by researchers : physiological measures, eg., skin resistance and potential, cardio-vascular rate; and projective techniques, eg., the Rorschach inkblot test, and the inventory or questionnaire which scales the level of anxiety.

An inventory which is widely used in research is the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970). State anxiety refers to the level of anxiety experienced by a person at any particular moment. It is transitory and "characterised by subjective, consciously perceived feelings of tension and apprehension and heightened autonomic nervous system activity"(p.3) Trait anxiety refers to "relatively stable individual differences in anxiety proneness, i.e., to differences between people in the tendency to respond to situations perceived as threatening with elevations in A-State intensity "(p.3). Levitt(1980) notes that "the anxiety prone individual is one who has a noticeable upsurge of feelings of anxiety on a relatively large number of occasions, under more circumstances and in a larger number of different situations than do his peers"(p.66).

The Trait form of the Inventory consists of 20 statements concerning feelings and cognitions. The subject is requested to respond to each of these statements by marking on a 4 point scale how they generally feel with regards each particular statement. The 4 points are represented by 1. 'almost never', 2. 'sometimes', 3. 'often', and 4. 'almost

never'. The State form of the Inventory asks the respondent to indicate how he/she is feeling at the very moment of responding. Subjects rate themselves on the 20 items along a 4 point scale represented by 1.'not at all', 2.'somewhat', 3.'moderately so' and 4.'very much so'. In this study state anxiety questions were presented alternately with state anger questions in Self Analysis Questionnaire 1; and trait anxiety alternately with trait anger items in Self Analysis Questionnaire 2.

The State and Trait Anxiety measure used in this study was taken from the Preliminary Manual for the State and Trait Personality Inventory (STPI)(Spielberger,1980). This consists of 10 items from the 20 item State and 10 items from the 20 item Trait Anxiety Inventory(Spielberger et al,1968). The STPI version of STAI (State-Trait Anxiety Inventory) has been normed on male and female college students and navy recruits.(See Table 1,Spielberger,1980)

Since the STPI Scale is in the preliminary stages of development, no data on its reliability and validity is yet available. However, there is a high correlation between STPI anxiety scores and STAI scores.

(See Table 4,Spielberger,1980) Studies on the reliability and validity of STAI will therefore be used as evidence of the reliability and validity of the STPI scale.

Test-retest reliability of the STAI for subgroups of the undergraduate college normative sample showed high correlations (.73 to .86) for the A-Trait Scale

whereas those for the A-State Scale were low (.16 to .54). This low correlation for the A-State Scale was expected and reflected the anticipated variability of A-State according to the situational context. Measures of internal consistency of the A-State scale produced alpha coefficients ranging from .83 to .92 for the normative samples. A-Trait coefficients were also high (.86 to .92).

The concurrent validity of the STAI Trait-Anxiety scale is supported by moderately high correlations for college students and patient samples, with the IPAT Anxiety Scale (Cattell & Scheier, 1963), and the Taylor (1953) Manifest Anxiety Scale. The Zuckerman (1960) Affect Adjective Checklist, General Form, is only moderately correlated. The construct validity of the A-Trait scale has also been supported (Lazarus & Opton, 1966).

Another factor which indicates the appropriateness of the use of this State-Trait-Anxiety Scale in this study is the use of the STAI in research with patient populations (Graham, 1960; Edwards, 1969; Parvio, 1969).

4.3.3.STATE AND TRAIT ANGER

The concept of anger has often been used interchangeably with the concepts of hostility and aggression. Spielberger (1980) considered that this has resulted in some confusion in research literature concerning the meaning of the term 'anger'.

The best validated measures of hostility have included the Rosenzweig Picture Frustration Study

(1945,1978) and the Buss-Durkee Hostility Inventory (1957), and MMPI Hostility Scales(1956). Research has explored the physiological correlates of angry feelings and aggressive behaviour but there has been little research into the actual measurement of angry feelings.

This study employed the Spielberger (1979) State-Trait Anger subscales from the STPI (Spielberger,1980). "Items for the STPI were selected from their parent scales (STAS,STAI,STCI) that met the following criteria: high item remainder correlations, relatively low item-scale correlations with the other 2 subscales and high factor loadings"(p.11). State anger is defined as an emotion characterised by "subjective feelings of tension, annoyance, irritation, fury and rage, and by activation or arousal of the autonomic nervous system". Since it is a state, its intensity could change over time depending upon the degree of frustration and annoyance experienced. Trait anger is defined in terms of the tendency to view a large number and variety of circumstances and stressors as annoying or frustrating or irritating and to react to such events with high state anger.

The State-Anger subscale consists of 10 items. Respondents are asked to answer items in terms of their feelings at the moment, on a 4 point scale ranging from (1) 'not at all', (2) 'somewhat', (3) 'moderately so', to (4) 'very much so'. These items formed part of the Self Analysis Questionnaire (1). The Trait-Anger subscale consists of 10 items. Respondents are requested to say with what frequency

they experience angry feelings in general. Ratings range from (1)'almost never', (2)'sometimes', (3)'often' to (4)'almost always'. State and Trait Anger scores are the sum total of the weighted responses to each item. Scores can therefore range from 10 to 40 for each subscale.

The state and trait anger items were normed on a group of navy recruits (198 males, 72 females) and college students (95 males, 185 females)(Tables 1 and 4, Spielberger,1980).

In a study by Westberry(1980) the 10 item Trait-Anger scale was administered to 280 college students and 270 Navy recruits. It was considered that relatively high alpha coefficients (.82 to .85) and large item remainder correlations in both samples reflected the internal consistency and reliability of the Trait-Anger scale.

Concurrent validity was supported by correlations of the Trait-Anger Scale with the Buss-Durkee Hostility Inventory (.66 to .73). Since anger and hostility scales correlated consistently, it was concluded that the scales measured similar concepts or at least concepts which entail shared meaning.

Barker (1979) has evaluated the Anger subscale as a predictor of performance problems in navy recruits. The Trait-Anger Scale has also been utilised in a study involving medical patients (Spielberger,1980).

4.3.4.DEPRESSION

Depression scales which have been used previously have been found to have a number of disadvantages. Carney's(1957) factor analytic studies of the MMPI Depression Scale have revealed that only one of the factors discovered was consistent with the construct of depression as the term is used by clinicians. O'Connor, Stefin & Gresock (1957) also questioned the scale's conceptual homogeneity. Messick (1960) has suggested that the MMPI is sensitive to subject response sets such as responding in terms of perceived social desirability (Beck, 1967, p.187). Adjective Checklists (Clyde, 1961; Zuckerman & Lubin, 1965) only report on subjective states, however, depression amounts to more than a subjective feeling state - it involves affect, cognition, motivation, and behaviour. Another difficulty is that not all depressed people will acknowledge their depressed state. In order to avoid the difficulties associated with the use of any of the aforementioned types of depression scales, a Depression Inventory formulated by Beck (1967) was employed in this study to measure the presence and severity of subjects' depression. This was presented to subjects as part of Self Analysis Questionnaire (1).

The construct of 'depression' was conceived of by Beck, as an "abnormal state of the organism manifested by signs and symptoms such as low subjective mood, pessimistic and nihilistic attitudes, loss of spontaneity and specific vegetative signs"(p.201-2). Beck considered that the

severity of depression could be conceived as occurring along a continuum from a point of no depression to one of maximum depression. The Beck Depression Inventory (BDI) measures that state of depression that is identifiable in all types of psychological and physical illness and is not to be confused with any particular category of depressive illness.

Items of the BDI were derived primarily from clinicians' observations of depressed clients. Beck (1967) noted that "the items were chosen on the basis of their relationship to the overt behavioural manifestations of depression and do not reflect any theory regarding the etiology and/or the underlying psychological processes in depression"(p.189).

The BDI consists of 21 items or categories of depressive symptoms and attitudes. The symptom attitude categories are:(1) mood (2) pessimism (3) sense of failure (4) lack of satisfaction (5) guilty feeling (6) sense of punishment (7) self-dislike (8) self-accusation (9) suicidal wishes (10) crying spells (11) irritability (12) social withdrawal (13) indecisiveness (14) distortion of body image (15) work inhibition (16) sleep disturbance (17) fatigability (18) loss of appetite (19) weight loss (20) somatic preoccupations (21) loss of libido (Beck,1967, p.189). The 21 items consist of a number of statements reflecting the above symptoms and attitudes. Associated with each item are 1 to 4 or 5 self-evaluative statements reflecting different levels of severity of the symptom or

attitude. The Depression score is derived from the sum of the weighted response selected by the subject on each of the 21 items. The weight is the number (1 to 4 or 5) associated with each statement. Item 19 on the subject of weight loss was designed to assess a symptom of anorexia. If the subject responds in the affirmative to the question placed adjacent to it, the score for that item is not added to the total score. Beck (1978) has suggested the following as a guideline to the interpretation of scores for the BDI:

0-9 normal range; 10-15 mild depression; 16-19 mild to moderate depression; 20-29 moderate to severe depression.

When the score for each of the 21 items was contrasted with the BDI total score for each subject in Beck's (1967) study, it was found that all categories were significantly related to the total BDI score using a Kruskal-Wallis non-parametric ANOVA by ranks. Split-half reliability revealed a reliability coefficient of .86 when the Pearson r between odd and even categories was analysed. A coefficient of .93 was found with a Spearman-Brown correlation.

In order to ascertain concurrent validity it is necessary to determine the degree of correspondence between BDI scores and other measures of depression. Biserual coefficients of .67 and .65 were obtained for correlations of scores on the BDI and clinical judgments of depth of depression in two studies (Beck, 1967, p.197). Schwab, Bialow & Holzer's (1967) study found a Spearman Rank correlation

coefficient of .75 between the BDI and the Hamilton Rating Scale. Correlations of scores on Depression Adjective Checklists and the BDI ranged from .40 to .66 (Lubin,1965). The highest correlation (.75) was found between the BDI and the MMPI Depression Scale. A Kendall's rank correlation coefficient of .61 was discovered between psychiatrists' ratings and the BDI scores (Metcalf & Goldman,1965).

Construct validity is supported by the findings of significant relationships between the BDI scores and masochistic dreams (Beck & Ward,1961), negative self-concept (Beck & Stein,1960), the tendency to identify with the loser in a series of projective tests (Beck,1961), childhood bereavement (Beck,Sethi,Tuthill,1963), negative predictions of performance (Loeb, Feshback, Beck & Wolf,1964; Loeb, Beck, Diggory & Tuthill,1966), hostility inward scale scores (Gottschalk,Gleser, & Springer,1963) and a lack of sense of humour (Numbaum & Mechaux,1963).

4.3.5.LIST OF RECENT EXPERIENCES

The List of Recent Experiences (LRE) was based on the 67 item inventory developed by Tennant & Andrews (1976) using an Australian population. Tennant & Andrews' list was in turn based on Holmes & Rahe's Schedule of Recent Experience (1967) and Paykel,Drusoff & Uhlenhuth's(1971) list. Items on the questionnaires are intended to represent situations in daily life which commonly acquire adaptation or readjustment. Life event inventories have been criticised on a number of bases, including the possibility of bias in item

content towards particular groups in the population. Individuals or groups who differ on social or demographic characteristics may experience life events not listed in the inventory or else not respond to those listed because the events are described in terminology different to that which they are accustomed to. Items may focus more on brief and transitory life events and not on stressful situations that are lengthy or ongoing (Henderson, Byrne, & Duncan-Jones, 1981, p.66). In the construction of the LRE, Tennant & Andrews' (1976) list was modified, taking into account the aforementioned criticisms. The item content was enlarged, items that were considered to be phrased in ways that were restrictive of interpretation and comprehension were reworded; items were rephrased in order to enable them to include protracted as well as transitory events; open-ended questions were included to enable the reporting of events not included on the list. (Henderson et al., 1981, p.66)

The LRE consists of 73 items, appearing in 12 categories: A. Illness, injury or accident; B. Bereavement; C. Pregnancy or childbirth; D. Changes in relationships; E. Separation; F. Changes in living conditions; G. Studying or school; H. Work situation; I Financial situation; J. Legal difficulties; K. & L. two open-ended questions on disappointments and continuous worry or stress.

A copy of the LRE with accompanying instructions for respondents may be found in the Appendix.

The measurement of life event stress takes two

forms in this study :

1. a simple frequency count
2. a distress weight

In the original sample of 756 subjects used by Henderson, Byrne & Duncan-Jones (1981), each subject was asked to make a subjective estimate of the effect of each life event experienced along the following 7 dimensions:

1. disruption, 2. need for adjustment, 3. depression, 4. anxiety, 5. anger, 6. helplessness, 7. upset.

The extent of the effect described was meant to reflect that experienced at the actual time of the life event. A list of distress weights was constructed so that each item had an associated "numerical index of impact" regardless of the person who experiences it. "Mean impact scores" were used when Tennant & Andrews' (1976) distress weights were not available. The mean impact score was "the mean value of the subjective estimates, averaged over all reports of any single recent experience" (Henderson et al., 1981, p.68). Where Tennant & Andrews' distress scores were available, a "weighted average of the mean impact score and the Tennant & Andrews' score" (p.69) was used. A list of the distress weights may be found in the Appendix.

The LRE was normed on a sample of 360 males and 396 females drawn randomly from an Electoral Roll for Canberra, A.C.T. No sex differences were found in reported frequencies of life events or distress scores. The frequency of life events was highest for single people and lowest for

those who were widowed. The mean cumulative distress score was highest for those who were separated, single and divorced. A decreasing occurrence of life event frequency was discovered in association with increasing age. There tended to be a higher frequency of life events and cumulative distress scores the higher the educational level of the subjects. In the sample of 396 women, the mean event frequency was 4.4 and the mean cumulative distress score was 53.2.

The LRE was given to 52 subjects attending a number of medical practices as patients, in a study by Steele, Henderson & Duncan-Jones (1980). The LRE was administered to the same group 7 to 14 days after the first administration. All subjects were requested to report on life events experienced within the previous 12 months. In the second administration of the LRE, the items were presented in a different order to control for recall of responses from the previous performance (Henderson et al., 1981, p.71). The LRE appeared to have a high reliability with a correlation of 0.94 for life event frequency as measured on the two occasions and 0.89 for the correlation between cumulative distress weights obtained on the two administrations of the LRE ($p < 0.001$) (p.72).

4.4.1. INDEPENDENT VARIABLES

The purpose of the research was to determine whether there was a significant difference between the UTI and US groups, and whether it was possible to differentiate

the two groups on the basis of their scores on a number of psychological measures. It was also desired to determine whether it was possible to assign subjects to one group or the other on the basis of their scores on the psychological variables.

The independent variables employed were the type of cystitis episode, either bacterial (UTI) or non-bacterial (US) cystitis. Membership of either group was decided on the basis of urinalysis results for the previous 6 episodes. The type of cystitis experienced on the majority of the 6 episodes was used to classify each subject in either the UTI or US group. If a subject experienced UTI 50% of the episodes and US 50% of the episodes then they were excluded from the study since unclassifiable. A number of subjects used in this study had either not experienced 6 episodes or else did not have access to diagnostic information for the last 6 episodes. In these instances any subject who had diagnostic information for at least the last 4 episodes and experienced one type of cystitis for more than 50% of those episodes, was included in the study.

4.4.2. THE DIAGNOSTIC CRITERIA

In the microscopic examination of the urine specimen of a healthy subject, a small number of cells and other elements which come from the genito-urinary tract including casts, epithelial cells from the lining of the urinary tract and the vagina in the female, spermatozoa in the male, and mucus threads, may be observed. It is not

usual to see more than 1 leukocyte or white blood cell (WBC), erythrocyte or red blood cell (RBC), or epithelial cell per high powered field (400X) in a healthy male, or more than 4 WBC's per high powered field in a healthy female.

1. Pus cells

Increase in the number of cells suggests disease of the urinary tract. Large numbers of RBC's may point to the presence of infection, tumour, calculi, or inflammation. Pus cells (WBC) may or may not be present with bacteriuria. It is difficult to find clinicians who agree on the number of WBC's that signify pyuria. "Pyuria has been arbitrarily defined as the presence of 5 or more WBC's per high power field, using a centrifuged specimen of urine. Pyuria defined in this way, occurs in one-third to one-half of patients with true bacilluria, depending upon the group, but occurs in only 2% of those with less than 100,000 bacteria/ml of urine" (Kass, 1956, p.61). This figure of 33%, however, was derived from a subject pool of 26 subjects. Twelve of these 26 subjects had asymptomatic bacteriuria and 4 of these 12 had more than 5 WBC/high power field. Kunin, Deutscher & Paquin (1964) considered more than or equal to 5 WBC/high power field as abnormal. Cunha (1981) considered greater than 10 WBC/high power field in a centrifuged specimen of urine an indicator of the presence of infection or inflammation. Variables that may influence standardisation of the number of WBC expected per high power field in a healthy urine specimen are the amount of urine centrifuged, the

volume of the drop examined, the size of the cover-slip, and area of the high power field. Kincaid-Smith (1971) states that "using a Fuchs-Rosenthal counting chamber and a drop of uncentrifuged urine the presence of one cell in the ruled area of the counting chamber represents 300/ml of urine and 10 cells represent 3,000/ml, thus more than 8 to 10 cells in the ruled area indicate an excess of cells"(p.16). The presence of the increased numbers of RBC's and WBC's does not in itself indicate infection since they "may also be found in patients with acute pyelonephritis, asymptomatic bacteriuria, and in up to 15 to 20% of patients without infection"(Lacy,1978, cited by Harris & Gilstrap,1981). However, the presence of increased WBC in conjunction with other diagnostic criteria may be considered significant.

2.Pure growth of single bacteria.

If many epithelial cells, lactobacilli or mixed bacterial growth is present then the urine specimen is possibly contaminated.

3.Number of bacteria present in the urine

Most specimens usually contain either less than 1000 or more than 100,000 organisms/ml. According to Kass (1956) the presence of more than 100,000 bacteria of the same type per millilitre in 2 consecutive specimens establishes a diagnosis of active infection of the urinary tract with 95% certainty. If fewer than 10,000 colonies/millilitre are present and if there are several types of bacteria present contamination is suggested.

It should be noted that a bacterial count of greater than or equal to 100,000/ml is not diagnostic of UTI with absolute certainty. The presence of significant bacteria is a statistical statement indicating there is a high probability that infection is present. In the previously cited example where two consecutive urine specimens yield more than 100,000 bacteria/ml, enabling a diagnosis to be made with 95% confidence, 1 in 20 individuals will provide 2 consecutive specimens with a bacterial count of more than 100,000 which will prove to be due to contamination.

Stamey(1978) has criticised Kass's (1956) study which provided the basis for the diagnostic criterion of 100,000 bacteria/ml of urine in the determination of the presence of infection, since it was based on the collection of a total voided urine specimen and not on a mid-stream urine sample (p.453). Sussman & Aascher(1979) also note that "the concept of significant bacteriuria, as formulated by Kass (1956), refers to specimens obtained from asymptomatic individuals infected with gram -ve bacilli. In the presence of symptoms and/or when organisms other than gram -ve bacilli are involved the confidence limits at various levels of viable bacterial count may well be quite different"(p.401). Komoroff, Pass, McCue, Cohen, Hendricks & Friedland (1978) considered that it was unwise to make an arbitrary threshold of 100,000 bacteria/ml or 5 WBC for UTI diagnosis since "certain clinical features of each patient affect the practitioner's willingness to overdiagnose or underdiagnose

a UTI on the basis of a urinalysis result" (p.1073). For example, in the case of a patient with diabetes or recurrent cystitis or renal disease the doctor may prefer to diagnose UTI with between 10,000 and 100,000 bacteria/ml and less than 5 WBC's revealed by urinalysis. In a young woman with no previous UTI history the requirements for a positive diagnosis may be stringently adhered to.

All doctors participating in this study indicated that they had no difficulty discriminating between significant and non-significant levels of bacteria. In the absence of definitive studies utilising subjects with lower urinary tract infection in the determination of what constitutes a significant number of bacteria, it appears appropriate to continue to utilise the three major criteria applied by pathologists and medical practitioners:

- 1.pure growth of single bacteria
- 2.at least 100,000 bacteria/ml
- 3.more than 10 WBC/high power field.

The following steps in urine collection were undertaken in order to ensure that the results of the tests were valid and clearly interpretable.

In subjects with bacteriuria, frequent voiding can result in low bacteria counts of between 100 and 5000/ml. Stamey (1978) suggests that urine specimens voided first thing in the morning are best to counter this. In subjects without bacteriuria, urine voided by the female can be easily contaminated by bacteria residing in the

urethra, around the vaginal vestibule, the pubic hair and the labia majora. If the urine specimen is collected carelessly, contamination with bacteria can result in numbers approaching 10,000 to 100,000 bacteria/ml. Mid-stream urine specimens also increase the probability of collecting an uncontaminated specimen.

Bladder catheterisation usually avoids the problems associated with urethral bacterial contamination of the urine but Stamey (1978) states that it can result in "reinfection of the bladder with urethral bacteria especially in the susceptible patient with heavy colonisation of the vaginal and urethral mucosa. Catheterisation should be avoided except in emergencies such as septicaemia" (p.453).

Suprapubic needle aspiration which involves the "direct puncture of the bladder through the abdominal wall with a needle and syringe" (Sonnerwirth & Jarrett, 1980, p.1579), is according to Stamey (1978) the ideal method to use since "statistical considerations from either frequent voiding or perineal colonisation are removed from the interpretation" (p.453). However this procedure may be viewed as unnecessarily intrusive by many women.

Urine is a good medium for the culture of bacteria particularly if left at room temperature for some time. Urine specimens should therefore be either immediately stored in a refrigerator at 4 C for no longer than 24 hours until they can be cultured or else taken to a pathology laboratory immediately and processed within 1 hour.

Preservative is also added to prevent the deterioration of cells and casts in the urine.

An outline of the laboratory procedure used by pathologists in the determination of diagnosis is tabled in the Appendix.

CHAPTER 5

RESULTS

5.1. INITIAL CLASSIFICATION OF SUBJECTS IN UTI OR US GROUP

The procedure for classifying subjects as members of either the UTI group or US group was outlined in the Method section. The classification was based on the type of cystitis (UTI or US) characterising the majority of cystitis episodes experienced by the subject over the previous few years. Table 1 gives the percentage of subjects in each group classified according to the number of episodes of either UTI or US experienced out of the total number of episodes experienced within the last few years. It is apparent that a large percentage of subjects in each group did not experience the same type of cystitis (UTI or US) with each episode.

TABLE 1. DIAGNOSTIC CLASSIFICATION OF SUBJECTS

Number of episodes	% UTI Group (n=32)	% US Group (n=17)
3/4	3	6
4/4	16	-
3/5	3	-
4/5	3	6
5/5	9.5	6
4/6	28	35
5/6	12.5	12
6/6	22	29
6/7	-	6
7/7	3	-

5.2.DEMOGRAPHIC CHARACTERISTICS

Items concerning age, parity, marital status, educational and employment level were included in the Cystitis Questionnaire. Age and parity were correlated with variables to be used in the discriminant function analysis (state anxiety, state anger, depression, trait anxiety, trait anger, life event frequency and life event distress scores). Since the other demographic characteristics (marital status, educational and employment level) were expressed

categorically rather than numerically they were not used in this analysis. Table 2 shows the relationships between these variables.

TABLE 2. CORRELATION OF AGE AND PARITY WITH DISCRIMINANT FUNCTION ANALYSIS (DFA) VARIABLES

DFA Variables	Age	Parity
State Anxiety	-0.3519	-0.3642
State Anger	-0.2447	-0.2090
Depression	-0.1179	-0.2646
Trait Anxiety	-0.3621	-0.3572
Trait Anger	-0.3150	-0.3501
Life event frequency	-0.2878	-0.2800
Life event distress score	-0.1588	-0.2244

The correlations between the DFA variables and demographic characteristics were low. This indicates that any significant relationships that are revealed by the discriminant function analysis between psychological measures and the experience of being either a UTI or US group member cannot be viewed as simply reflective of demographic considerations.

In order to ascertain that there was no significant difference between the UTI and US groups on the demographic characteristics, Chi-square tests were performed for marital status, educational and employment level. No

significant differences were found for marital status (Chi-square = 0.269, d.f. = 2), educational level (2.429, d.f. = 4) and employment level (Chi-square = 0.292, d.f. = 2). No significant differences were found using T-tests for age and parity.

5.3. CYSTITIS EPISODES

Cystitis episodes were categorised as first beginning (1) between 6 months and 2 years ago, (2) between 2 and 5 years ago, and (3) more than 5 years ago. The data is depicted in Table 3.

TABLE 3. LENGTH OF TIME SINCE FIRST CYSTITIS EPISODE EXPERIENCED

Time	% UTI Group (n=32)	% US Group (n=17)
(1)	18.75	17.65
(2)	18.75	5.88
(3)	62.5	76.47

Since 2 of the cells involved very small numbers, no Chi-square analysis was performed to ascertain significant differences between the two groups. It may be noted however that a relatively larger percentage of US subjects experienced their first cystitis episode more than 5 years prior to the most recent episode. A larger percentage of UTI subjects experienced their first episode of cystitis

between 2 and 5 years prior to the most recent episode.

5.4.CONTRACEPTION

Contraceptive use was categorised as (1) chemical (the Pill), (2) mechanical (IUD, the diaphragm), and (3) no contraception. A Chi-square analysis was performed to determine whether there were significant differences between the two groups concerning contraceptive use. An overall Chi-square analysis of the data revealed no significant difference between the two groups (Chi-square = 1.355,d.f.=2). The statistics do indicate that there is some difference between the two groups' use of chemical and mechanical contraceptives. UTI Group subjects were more likely to use chemical contraception and US Group subjects were more likely to use mechanical contraception. Table 4 indicates the proportion of subjects in each group using chemical,mechanical or no contraception.

TABLE 4.CONTRACEPTIVE USE OF UTI AND US GROUPS.

Type of Contraception	% UTI Group	% US Group
(1)	31.25	17.65
(2)	18.75	29.41
(3)	50.00	52.94

5.5.DISCIMINANT FUNCTION ANALYSIS

The primary aim of this study was to determine whether there was a significant difference between UTI and US subjects on the basis of their scores on a number of

psychological measures , and that US subjects would have significantly higher scores on the psychological variables than UTI subjects. It was further intended to ascertain whether a subject could be assigned membership to either the UTI or US group on the basis of their scores on the psychological measures. A discriminant function analysis was performed in order to discover answers to the aforementioned research questions.

It was initially necessary to perform preliminary analyses of variance for each of the variates to be included in the discriminant function analysis (DFA), in order to ensure that the assumptions for a multivariate analysis were fulfilled. The analyses of variance for the variates 'state anger', 'trait anxiety' and 'trait anger', revealed that subject 33 scored higher than 3 standard deviations from the mean for the two groups. The analysis of variance performed for the variate 'weighted life event distress score' revealed that subject 21's score was more than 3 standard deviations from the mean for the two groups. If the data for these two subjects on these variates were included in the discriminant function analysis, the assumption of normality would be violated. The data for these subjects for the variates concerned were therefore excluded from the discriminant function analysis. The assumption of homogeneity of covariance was fulfilled.

A discriminant function analysis was conducted to determine whether there was an overall significant

difference between the UTI and US groups' scores on the psychological measures. The analysis revealed a significant difference between the two groups (Chi-square = 16.115, d.f. = 7, p. .01). It can be seen from Figure 2 that the two group means are relatively well separated.

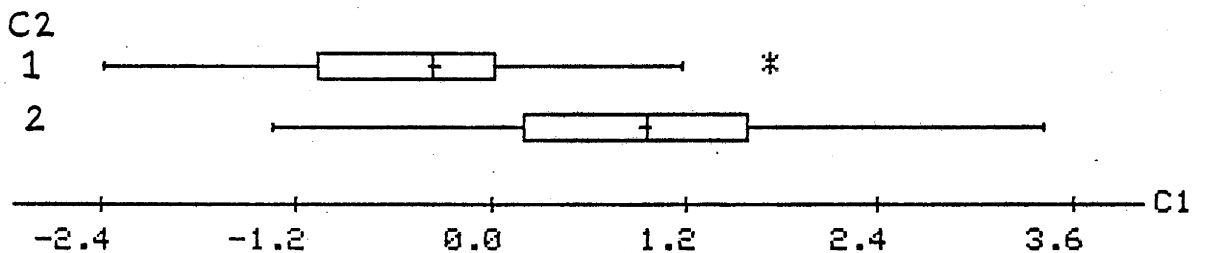


FIGURE 2. GROUP MEANS FOR UTI AND US GROUP SUBJECTS

The discriminant function analysis (DFA) enables statistical distinctions to be made between the two groups. Since it is probable that no single variable will perfectly differentiate the two groups, several discriminating variables are used in the DFA. It is hoped that by weighting and linearly combining the discriminating variables, a single dimension on which the two groups will cluster differently will be found, a dimension on which the two groups will be as statistically distinct as is possible (Nie, Hull et al, 1975).

A stepwise procedure is performed in order to find the single best discriminating variable. The second and subsequent variables are selected in a similar way in accordance with their ability to contribute further to discriminating between the two groups. The preselected criteria for eliminating discriminant functions was Method=Mahal which "seeks to maximise the Mahalanobis distance between the two closest groups"(Nie et al, 1975, p. 449).

The test of statistical significance employed was Wilk's Lambda, transformed into a Chi-square statistic. The ability to discriminate between the two groups is enhanced by the stepwise procedure used in the DFA. Summary statistics are presented in Table 5. The standardised discriminant function coefficients are listed in order of highest to lowest contributor. each discriminant function coefficient represents the relative contribution of its associated variable to that function. The sign simply

indicates whether the variable is making a positive or negative contribution (Nie et al.,1975,p.443).

TABLE 5.STANDARDISED DISCRIMINANT FUNCTION COEFFICIENTS
CONTRIBUTING TO DISCRIMINATION BETWEEN UTI AND US GROUPS.

Variate	Coefficient
Life event frequency	-1.03409
Trait anxiety	0.86936
Life event distress score	0.60380
Trait anger	-0.59734
Depression	0.57214
State anxiety	-0.42349
State anger	0.14711

The results show that life event frequency, trait anxiety and life event distress score are the major contributors to the differentiation of the two groups. Trait anger, depression, and state anxiety are the next best discriminators. State anger scores make a negligible contribution to the discriminant function.

US group subjects, according to this analysis, are more likely to have lower life event frequency, higher trait anxiety, higher life event distress , lower trait anger, higher depression , lower state anxiety and higher state anger scores than UTI subjects. These results

support some of the original hypotheses : that US group subjects would be more likely to experience higher stress levels in response to life events, higher trait anxiety depression and state anger scores. The results do not support the hypotheses that US subjects would be more likely to have higher trait anger, state anxiety, and life event frequency scores. Figure 3 reveals the ability of the discriminant function to differentiate the two groups.

Table 6 compares mean scores for the DFA variables with mean scores for normative samples.

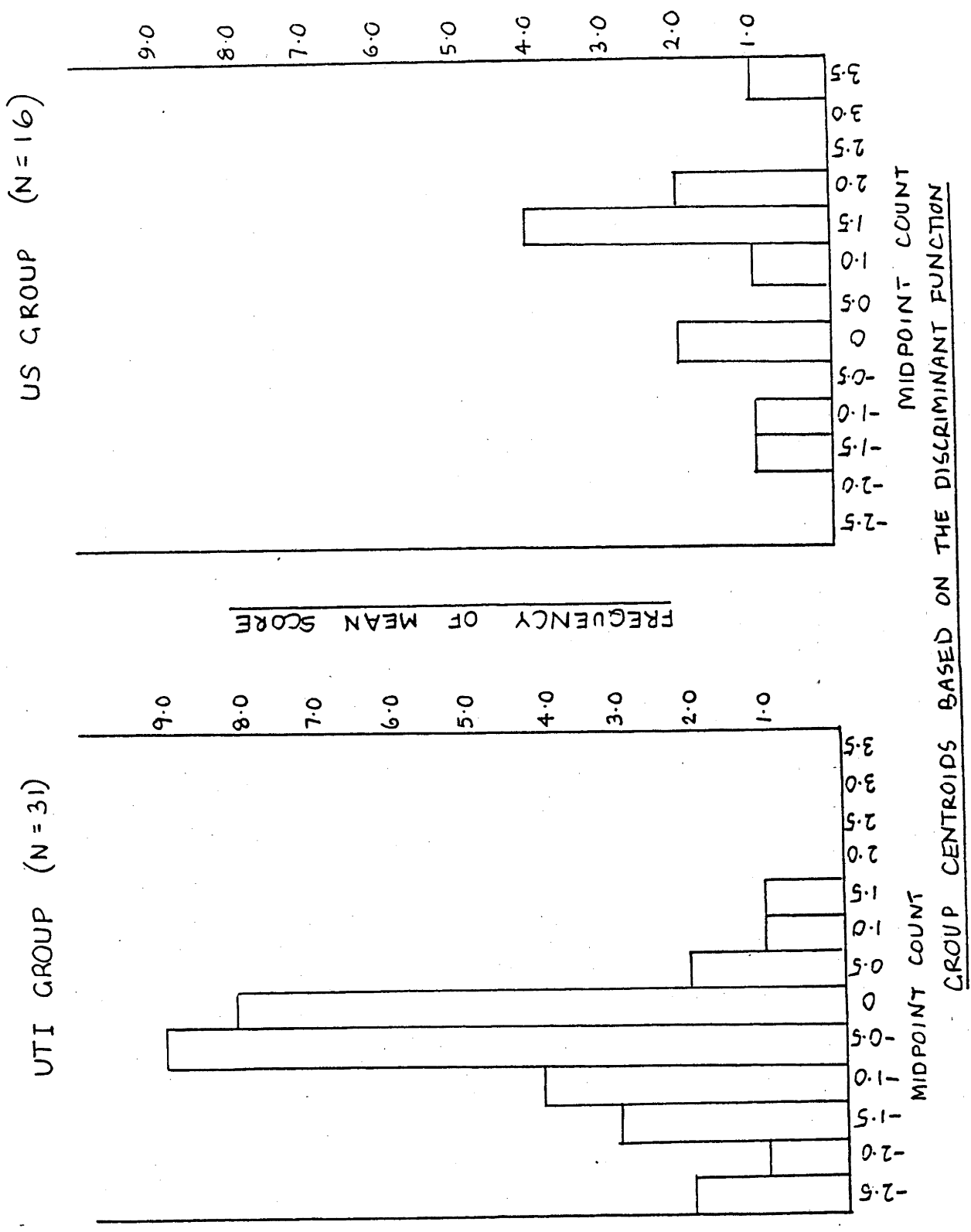


FIGURE 3: HISTOGRAM OF CANONICAL DISCRIMINANT FUNCTION FOR UTI & US GROUPS

TABLE 6.COMPARISON OF UTI AND US GROUP MEANS WITH NORMATIVE
GROUP MEANS FOR DFA VARIABLES

Independent Variable	UTI Group	US Group	Spielberger's (1980) Female Normative Samples	
			College	Navy
State Anxiety	16.97	18.35	19.06	23.88
State Anger	12.41	12.13	14.24	15.07
Trait Anxiety	16.25	19.69	19.38	19.24
Trait Anger	16.56	15.69	19.14	19.63
Henderson,Byrne,Duncan-Jones (1981) female normative sample				
Frequency of life events	5.13	4.53	4.4	
Life event distress	72.9	80.1	53.2	

The DFA also enables the derivation of a "set of classification functions...which will permit the classification of new cases with unknown memberships" (Nie et al., 1975,p.536). This classification procedure can also be used as a further test of the adequacy of the discriminant function. It is possible to classify the subjects used in this analysis and ascertain the number who are correctly classified by the variables used to discriminate the two groups. "The procedure for classification involves the use of a separate linear combination of the discriminating variable for each group. These produce a probability of membership in the respective group and the case is assigned to the group with the highest probability"(Nie et al.,1975,p.436).

Table 7 shows the power of the discriminant function to classify subjects as members of the UTI or US group. It can be seen that overall, 81.05% of the group subjects are classified correctly by the discriminant function. The discriminant function variables are more successful in detrmining membership of the UTI group (87.1%) than the US group (75%).

TABLE 7. PREDICTED MEMBERSHIP OF UTI AND US GROUPS.

Group	Predicted Group Membership	
	UTI Group	US Group
UTI (n=31)	87% (n=27)	12.9% (n=4)
US (n=16)	25% (n=4)	75% (n=12)

Using the discriminant scores for each subject it was possible to determine precisely which subjects in the UTI and US groups were incorrectly classified. A post hoc analysis of the scores on the psychological measures for each of these subjects revealed that of the 4 subjects incorrectly classified as members of the UTI group, 4 scored high on trait anxiety, 2 low on life event frequency, 2 high on life event distress, 2 low on trait anger and 2 low on state anxiety measures. Of the 4 subjects incorrectly classified as US group members, 2 scored high on life event frequency, 4 low on trait anxiety, 2 low on life event distress, 1 high on trait anger and 4 low on depression measures.

5.6.KNOWLEDGE OF AND BELIEFS ABOUT POSSIBLE CONNECTIONS BETWEEN STRESS AND SYMPTOMS

Subjects were asked whether they were aware of a possible connection between psychological stress and cystitis symptoms. 28.12% of the UTI group and 47.06% of the US group subjects were aware that this was a possible factor. A Chi-square analysis of the data revealed that there was no significant difference between the two groups concerning knowledge of this possible connection (Chi-square = 1.757, d.f.=1). Subjects were also asked to indicate whether they believed that psychological factors were completely, in part, or not at all, responsible for their cystitis symptoms. Table 8 shows the percentage in each group who either did or did not attribute their symptoms to psychological factors.

TABLE 8. BELIEFS CONCERNING THE ROLE OF PSYCHOLOGICAL FACTORS
IN CYSTITIS

Role Played by Psychological Factors	UTI Group	US Group
1. Completely responsible	- (0)	5.88% (1)
2. Partially responsible	40.63% (13)	47.06% (8)
3. Not at all responsible	59.38% (19)	47.06% (8)

There was no significant difference overall between the two groups (Chi-square = 2.295, d.f. = 2). It was important to ascertain this information since subjects' responses to questions about psychological state may have reflected their beliefs about the nature of their illness.

5.7. SEX AND CYSTITIS SYMPTOMS

In the UTI group 71.88% and in the US group, 41.18% of subjects reported having had sex within the 48 hours prior to first noticing cystitis symptoms. A Chi-square analysis revealed that there was a significant difference between the two groups (Chi-square = 4.407, d.f. = 1). The hypothesis that UTI Group subjects were more likely than US group subjects to have had sex within the 48 hours prior to experiencing cystitis symptoms was therefore supported. These results need to be interpreted with caution however since 93.75% of UTI subjects reported that they were accurate about having had sex just prior to symptom appearance whereas only 64.71% of US subjects reported being accurate with this information. A Chi-square analysis indicated a significant

difference between the two groups (Chi-square = 6.855, d.f. = 1) on the matter of accuracy. Subjects also completed the questionnaire on the average about a week after the symptoms were first noted (UTI group mean = 6.56 days, range = 0 - 30 days; US group mean = 7.82 days, range = 0 - 36 days). This also indicates the possibility of inaccuracies in this data.

CHAPTER . 6

DISCUSSION

6.1 DIFFERENCES BETWEEN THE TWO GROUPS

It was hypothesised that US group subjects would have higher scores for life event frequency and distress, state and trait anxiety, state and trait anger, and depression than UTI group subjects. The results revealed that US group subjects had higher scores for trait anxiety, life event distress, depression and state anger but lower scores for life event frequency, trait anger and state anxiety than UTI group subjects. The first hypothesis was therefore not fully supported. The best discriminator variables were life event frequency, trait anxiety, life event distress, trait anger and depression scores.

It was possible to determine a weighted linear function of the discriminator variables which successfully allocated subjects to correct groups at a greater than chance level. Of all subjects, 81.05% were classified correctly. The discriminator variables were better predictors of UTI than US group membership since 87.1% of UTI sufferers and 75% of US sufferers were classified in the appropriate group.

A number of previous studies have discerned no

significant differences between UTI and US subjects (Brooks & Maudar,1972; Rees & Farhoumand,1977) for prior history of psychiatric disorder, subjectively perceived relationship between emotional trauma and symptoms, and scores for the Eysenck Personality Questionnaire, the Morbid Anxiety Inventory, and the 6 sub-scales of the Middlesex Hospital Questionnaire. However, non-significant trends towards higher neuroticism scores in US subjects compared with UTI subjects was revealed in Heap's(1976) study. The results of the present research indicate that US subjects score higher than UTI subjects on life event distress, and some measures of emotional distress. Both groups experience levels of life event distress that are higher than the mean score attributed to the normative sample. It was found that there were no significant differences between the two groups concerning subjects' knowledge and beliefs about the possible connections between stress, psychological factors and their symptoms. This was important to ascertain since subjects' responses to the List of Recent Experiences and the Self Analysis Questionnaires may have reflected their beliefs about the etiology and nature of their illness.

6.2.LIFE EVENTS AND LOWER URINARY TRACT DISORDER

6.2.1.LIFE EVENT FREQUENCY

It was hypothesised that the US group subjects would have a higher life event frequency score in comparison with UTI group subjects. The data revealed however that the mean life event frequency for the UTI group was 5.13 and for

the US group was 4.53, so this hypothesis was not supported.

Simple frequency counts of life event stress were originally utilised in stress-illness research (Rahe, 1967). Very high correlations between frequency scores and consensual stress weights have been found (Rahe, 1973; Zimmerman, 1983) suggesting that measures of life event frequency may be an equally valid method of determining the strength of association of stress and illness.

6.2.2. STATISTICAL AND CLINICAL SIGNIFICANCE

It is interesting to note that the normative female sample for the LRE scored 4.4 life events over the prior 12 month period. This indicates that there is little difference between the frequency of life events experienced by the UTI and US groups and a population sample of women not characterised as sufferers of any particular psychological or physical illness. It suggests that the total number of life events experienced by UTI and US group subjects may have been unaffected by the presence of illness symptoms. It is also important to recognise that even though there is a statistically significant difference between the two groups on life event frequency, the clinical significance of 0.6 life events difference between the two groups is questionable.

The earlier use of life event frequency measures was based on the assumption that no significant differences in the stress aroused by different events and between groups and individuals in response to the same event, existed.

Further studies have explored the capacity of subjective measures of life event distress to improve the significant correlation between life event stress and illness. Most revealed very high correlations between frequency and weighted distress score measures (Zimmerman,1983). Other research has indicated that the detrimental consequences of life event impact depend not only on the number of life events but also on the quality and subjective importance of the incidents (Masuda & Holmes,1978; Cline & Chosey,1972; Cooley & Keesey,1981; Lei & Skinner,1980; Rahe,1974) . So it is important to decide when it is more appropriate to use either frequency scores or consensual or idiosyncratic distress weights in studies of life event - illness relationships.

The results indicate a higher frequency of life events for the UTI group and higher distress weight scores for the US group. This may be interpreted as indicating that while UTI group sufferers are more likely to experience a higher number of life events, US group subjects are more likely to experience events that occasion greater distress.

In view of the conceptual precision offered by weighted distress indices, the distress score may be viewed as a more suitable variable for use as a discriminator between the two groups. The finding that the frequency of life events was very similar for both UTI and US groups and the normative group , whereas the distress scores for both UTI and US groups were much larger than that for the

normative sample is another factor indicating the greater suitability of the consensual distress weight score as a discriminator variable.

6.2.3.LIFE EVENT DISTRESS

It was hypothesised that US group subjects would score higher for life event distress than UTI group subjects. This hypothesis was supported. The mean life event distress score for the US group was 80.1 and for the UTI group was 72.9. Distress levels aroused in response to life events may therefore be more significantly implicated in the onset, maintenance and recurrence of symptoms in US subjects than UTI subjects. Previous research by Chertok, Bourguignon, Guillon & Aboulker (1977) found that many US sufferers associated symptom onset with SLE's. There was no comparison with UTI subjects in their study.

The results also accord with the multitude of studies which have found significant correlations between SLE's and illness retrospectively (Wyler, Masuda & Holmes, 1971; Cline & Chosey, 1972; Dohrenwend, 1973; Rahe, 1975) and prospectively (Meyer & Haggerty, 1962; Rahe, 1968; Holmes, 1970; Holmes & Rahe, 1970). Psychological stress has also been connected with the onset of cardiovascular disorders (Jenkins, 1976; Ostfeld & Esker, 1984), asthma (Rees, 1956, 1964; Sclaire, 1959) and cancer (Fox, 1978; Horne & Picard, 1979; Sklar & Anisman, 1981). Comparisons with stress indices commonly found in other populations with significant SLE - illness correlations cannot be made since a different

measure of life event distress was used in this study. In accordance with Selye's(1956) non-specificity theory, the results may support the notion that SLE's contribute to a decrease in the overall resistance to disease.

6.2.4.SEVERITY OF LIFE EVENTS

It was not possible to statistically analyse differences between the two groups concerning the type and severity of events experienced by each group, however given that the distress score was derived from a qualitative assessment of the degree of (1) upset, (2) disruption, (3) adjustment, (4) depression, (5) anxiety, (6) anger, (7) helplessness and (8,9,10) control, occasioned by each event, it seems that US group subjects experienced events that were qualitatively more stressful than UTI group subjects. As Thoits (1983) noted, "the more severe a single undesirable event, or the more undesirable events experienced, the more likely coping abilities will be overwhelmed and disorder result" (p.57). Brown & Harris (1978) found a significant relation between severe life events and depression.

6.2.5.STATISTICAL AND CLINICAL SIGNIFICANCE

The mean life event distress score for women in Henderson,Byrne & Duncan-Jones' (1981) study was 53.2 while that for the UTI group was 72.9 and the US group 80.1. This suggests that there may be some clinical as well as statistical significance in the relationship between degree of distress and illness symptoms in the UTI and US groups.It

is not possible, on the basis of approximately 10 distress points' difference between the two groups to infer that the US group subjects' illness symptoms are more affected by psychological distress in response to life events than UTI group subjects. Both groups register higher life event distress weights than the mean for the normative sample so both UTI and US sufferers' symptoms may be affected by higher distress levels. Conversely the presence of symptoms or their recurrence may increase the likelihood of experiencing more stressful life events than people without such illness symptoms.

These results appear to be in accordance with Engel's (1960) and Lipowski's (1973) assertions that single cause formulations of illness etiology are oversimplistic. It is not possible to assert that either US or UTI is 'more psychosomatic' in its origin or its present state than the other disorder. A number of researchers have postulated that all urological disorders are related to psychological factors (Freud, 1905; Dejerine & Gauckler, 1911; Chertok et al., 1977) and no differences between UTI and US groups were found by Brooks & Maudar (1972) or self-reported connections between symptom onset and emotional trauma. Another factor which supports the notion that UTI sufferers may be just as likely to be affected by psychological stress as US sufferers is Selye's conclusion with regards GAS that microorganisms may cause damage if our resistance to infection is lowered, through for example, stress.

6.2.6. CONTAMINATION OF LIFE EVENT DATA

The high life event distress scores may be contaminated by prior illness. For example, Wershaw & Reinhart (1974) found no significant life event-illness correlations for newly admitted patients to a Veterans' Administration Hospital. It was concluded that one factor responsible for the absence of correlations may have been the requirement that subjects included in the study were only those who had no prior hospitalisation in the previous two years. It was not possible to utilise subjects with no prior illness in this study. Recurrent cystitis sufferers were required as subjects and this obviously necessitated the use of subjects who had experienced illness symptoms in recent months and years. One source of contamination results from the possibility of knowledge of illness affecting emotional state and subjective perceptions of stressful events. Group consensual distress weights were employed rather than individual subjective perceptions of life event stressfulness in this study. Consensual life event distress weights enable the avoidance of individuals possibly rating life events as more stressful or requiring more readjustment than in actuality in order to explain the presence and severity of their illness symptoms.

It is not possible to ascertain the etiological relationship between stress and illness because it is unknown whether SLE's are a consequence of the recurrent disorder or emotional states or whether they are at least in part

etiologically related to illness symptoms and emotional distress. It is not however the fundamental concern of this study to ascertain causal relationships since life stress, illness symptoms and emotions are all viewed as part of a cybernetic feedback loop with no specified beginning or ending. Even if life stress is not the 'cause' of disease symptoms, its presence may exacerbate illness and contribute to its recurrence. It is possible that connections between stress and illness may simply reflect the influence of other variables not measured eg. coping skills or social support.

6.2.7.SUMMARY

Hinkle (1973) noted that the 'non-specific' response to stress is non-specific only to a point. Paykel (1978) reported that stressful life events are only partially responsible for illness. A host of other variables may interact to produce and perpetuate illness. Often SLE - illness correlations reported have been very low, indicating that life event stress accounts for a small proportion of the variance associated with illness. It is therefore important to ascertain those other variables which are involved in the development and recurrence of cystitis. Stress is not a simple etiological agent of disease. It is in complex interaction with emotional, cognitive and motivational factors, constitutional tendencies, environmental factors, social support and the disease process itself.

Non-specificity theories view stress as a precipitator of disease in general whereas specificity

theories propose that specific psychological, social and genetic factors have a predictable relationship with specific physiological and somatic disorders. In the next section of the Discussion the relationship between stress, psychological state and illness will be explored. Spilken & Jacobs' (1971) study revealed that 71% of healthy subjects were predicted to require health care on the basis of life change, degree of affect, distress and coping style, while degree of affect was the best predictor of the extent of a health problem.

6.3.STRESS,EMOTIONS AND ILLNESS

6.3.1.ANXIETY,STRESS & ILLNESS

The second best discriminating variable between the UTI and US groups was Trait Anxiety. US subjects were more likely to have higher Trait Anxiety scores than UTI subjects.

Previous research investigating the association between anxiety and cystitis has found that 40% of US subjects complained of anxiety, depression or phobias (Chertok, Bourguignon, Guillon & Aboulker,1971) however no comparisons with UTI subjects were made and the assessment was based on an interview and not on objective data. Significantly greater free-floating anxiety was found by Rees & Farhoumand (1977) in recurrent cystitis subjects than in a healthy control group. No differences for phobic anxiety and neuroticism were found. The Morbid Anxiety Inventory (Salkind,1969). also revealed high levels of anxiety in the urinary tract disorder group. No significant differences

between the UTI and the whole urinary tract disorder group were revealed for any of the variables however no comparisons were made between the 14 UTI and 36 US subjects. Schmidt & Tanagho (1981) found that US sufferers experienced an abnormally high tension within the voluntary urethral sphincter muscle which was lessened at times of low anxiety. No comparisons with UTI sufferers were made. The only study found which has attempted an objective assessment of differences between the UTI and US groups on anxiety levels was the unpublished study by Heap(1976) which found non-significant trends towards higher neuroticism scores for the US group.

Anxiety has been found to be a predictor of the onset of cardio-vascular disorders (Jenkins,1976; Ostfeld & Esker,1984) and correlated with rises in peripheral resistance and blood pressure levels (Pilowsky et al,1973) and lability of BP (Thouler,Friedman, Harstfield,Kleinet & Rokering,1982). Purcell (1962,1963,1965) reported higher anxiety levels in rapidly remitting asthmatics than in steroid dependent asthmatics. A large percentage of asthmatics have reported being frequently anxious and fearful prior to an attack (Sclare,1959). Anxiety reactions to losses and separations have been significant amongst leukemia and lymphoma patients (Greene ,1966). Significant correlations were found between SLE, state and trait anxiety and illness in a study by Reavely (1974).

The majority of the aforementioned studies do

not indicate whether the anxiety measures reflected subjects' state or trait anxiety. In this study US group subjects had higher trait and lower state anxiety scores than UTI group subjects. State anxiety was determined as the 6th best discriminating variable between the two groups.

Even though there was a statistical difference between the two groups for trait and state anxiety, its clinical significance is difficult to ascertain since the mean state anxiety scores for UTI and US groups and the mean trait anxiety score for the UTI group were lower than those for the female college and navy normative samples used by Spielberger (1980). The mean trait anxiety score for US subjects was only marginally higher than that for the normative samples. Considering the large number of studies exploring associations between anxiety and illness which reveal more significant correlations between anxiety and ill health than good health (Schwab et al, 1965, 1966), it is interesting to find such low anxiety levels in this study, particularly given the recurrent nature of the illness.

Smith, Johnson & Sarason (1978) and Johnson, Sarason & Siegel (1979) have found that moderator variables such as low sensation seeking and external locus of control influence whether or not anxiety is experienced in response to life stress. The subjects in this study may have other characteristics not measured which help diminish anxiety levels in response to stress and illness.

It is interesting that Trait Anxiety scores

were much lower for UTI subjects than US subjects and those in the normative samples. Thomas & Greenstreet (1973) found lower anxiety scores amongst those who developed cancer years after testing than for those who developed other forms of illness or remained disease-free.

Correlations between stress and anxiety were found by Dekker & Webb (1974), Vinokur & Selzer (1975), Cooper & Sylph (1973), and Byrne (1984). It is interesting to observe that US group subjects who had the higher life event distress weight scores also had the higher trait anxiety scores in comparison with the UTI subjects. Trait anxiety may increase the likelihood of experiencing SLE's and/or experiencing them as anxiety provoking and stressful enough to contribute to the development of illness.

6.3.2. ANGER, STRESS AND ILLNESS

US group subjects scored lower for trait anger than UTI subjects. This result did not support the hypothesis that US group subjects would score higher for trait anger than UTI subjects. Trait anger was the fourth best discriminating variable. Mean trait anger scores for UTI and US groups were lower than the mean scores indicated for Spielberger's (1980) female normative samples. Even though there was a statistical difference in trait anger scores between the UTI and US groups it is difficult to determine the clinical significance of a 0.87 point difference in the mean trait anger scores for the two groups. State anger score was the least discriminating variable between the two

groups. Mean state anger scores for both groups were lower than those for both normative groups.

Anger mismanagement has been related to CHD by many researchers (Weiner,1977; Diamond,1982) and anger appears to evoke the greatest cardiovascular responses (Schwartz, Weinberger & Singer,1981). Rapidly remitting asthmatics more frequently had asthma attacks in association with anger than steroid dependent asthmatics (Purcell, 1962,1963,1965). Sclaire (1959), Knapp & Nemetz (1960) have noted that anger preceded a large percentage of asthma attacks. Vinokur & Selzer (1975) correlate aggression with three different SLE ratings and anger has been reported in association with illness (Deitch & Shulkin,1962). In the light of research indicating association between stress and anger and illness it is interesting that trait and state anger scores for the UTI and US groups were so low

Repressed anger and inability to express hostile feelings and emotions have been found to be predictive of cancer diagnosis by Renneker & Cutler(1952),Solomon (1969), Hagnell (1966), Greer & Morris (1975). Low trait and state anger scores do not necessarily indicate anger repression but this may highlight an interesting area for further research.

6.3.3.DEPRESSION,STRESS & ILLNESS

Depression , as measured by th Beck Depression Inventory (1967) was the 5th best discriminator between the UTI and US groups. Depression scores were higher for the US group than for the UTI group subjects, as hypothesised.

However the scores for both groups were within the range indicated by Beck as normal. The clinical significance of the statistically significant difference between the two groups is therefore dubious.

These findings are in accordance with those of Rees & Farhoumand(1977) who discovered no significant difference between cystitis patients and healthy control group subjects for a depression subscale of the Middlesex Hospital Questionnaire. In their study however, no significant differences were found between the UTI and US groups, whereas the current study does indicate a difference.

It is interesting to note the low depression scores in this study considering the number of studies which significantly correlate SLE's and depression (Bidzinska,1984; Paykel,1969; Paykel et al.,1969; Thomas & Hendrie,1972; Paykel & Tanner,1976), SLE's, depression and psychophysiological symptoms (Markush & Favero,1974; Vinokur & Selzer,1975; Parens,McConville & Kaplan,1966); asthma and depression (Purcell,1962,1963,1965; Knapp & Nemetz,1951); and cancer and depression (LeShan,1959; Schmale & Ilker,1966; Greene,1966; Hagnell,1966). However, in accordance with the findings of the aforementioned studies, the US group had both higher distress scores and higher depression scores than UTI subjects.

The low BDI scores are also surprising in the light of research which indicates that a large percentage of hospital patients have symptoms of depression (Ripley,1947;

Poe et al, 1966; Steward et al., 1965) and Schwab et al. (1965, 1966) were able to differentiate hospital patients and depressives on symptoms of depression including fatigue, lethargy, insomnia and upper gastro-intestinal tract disturbance but not on recent weight loss, chest tightness or pain, tachycardia, generalised pain, libido loss, urinary disturbances such as frequency and dysuria.

It may be that the time at which the BDI was completed by respondents was important. If Questionnaires had been answered either just prior to or during symptom onset, BDI scores may have been higher. Previous research on depression and SLE correlations has been criticised for its retrospectivity - subjects' effort after meaning may have inflated depression scores. This criticism does not appear to be relevant to the findings of this study.

It is important to remember that this study explored the relevance of only a few psychological variables to the differentiation of UTI and US group subjects. Social skills deficits, the absence of positive reinforcement, coping skills and a sense of helplessness and hopelessness are often associated with depression. Brown et al (1975) found that women with no social support and high stress levels were significantly more likely to develop depression than those with confidantes. The low BDI scores evident in this study may have reflected the presence of other variables such as these which may decrease the likelihood of experiencing depression.

The results may also support the findings of Warheit (1979) who discovered in a study exploring connections between SLE's, coping resources and depression that the best predictor of depression at Time 2 was a subject's depression score at a previous time. It may be that subjects in this study were simply not prone to depression.

6.4.SEX AND CYSTITIS

It was hypothesised that UTI subjects were significantly more likely to have engaged in sexual intercourse in the 48 hours prior to the appearance of cystitis symptoms. The results indicated that 71.88% of UTI subjects and 41.18% of US subjects had sex within the time period.

Research by Kunin & McCormack (1968), Kunin (1970) and Vosti (1975) have indicated the association between sex and UTI. Other factors apart from sex though, appear to be implicated in the development of cystitis symptoms : the presence or absence of bacteria in the urethro-vaginal area prior to intercourse (Cox, Lacy, Hinman, 1968; Stamey, 1971; O'Grady,Richards,McSherry,O'Farrell & Cattell,1970); and the prior tendency to experience recurrent cystitis (Nicolle,Harding,Precksaitis & Ronald,1982). No studies comparing the association between sex and cystitis amongst UTI and US sufferers was available. The results from this research indicate a greater likelihood for UTI than US subjects to have engaged in sex in the 48 hours prior to

symptom appearance. However a significantly smaller percentage of US than UTI subjects were certain of the accuracy of their response to this question. Further research is needed to investigate for differences between the two groups before any conclusions may be drawn. The association between sexual activity and cystitis symptoms may be coincidence, correlation does not equal causation and other factors may need to be present before sex contributes to the development of cystitis symptoms. If this were not the case then women would develop cystitis symptoms each time they had sex.

6.5 DIAGNOSTIC CLASSIFICATION OF SUBJECTS

Subjects were classified as UTI or US group members on the basis of the predominant type of cystitis episode experienced. A large percentage of subjects did not experience the same type of cystitis at each episode. It is possible therefore that the results may have been biased since some subjects may have been either unclassifiable or classified in the other group on the basis of the next and further cystitis episodes.

The fact that 49.5% of the UTI subjects and 65% of US subjects experience different types of cystitis provides evidence suggesting further difficulties in clearly differentiating between the two groups on the basis of psychological and behavioural measures.

The diagnostic criteria used to establish group membership for this study are those widely used by medical

practitioners to determine a diagnosis of UTI however there are questions concerning the validity and meaning of these criteria in relation to lower urinary tract symptoms of inflammation and infection.

6.6 REPRESENTATIVENESS OF SAMPLE

The relative percentage of UTI and US subjects in this sample was similar to that reported by other researchers. In this study 34.7% were classified as US and 65.3% as UTI sufferers. Gallagher, Montgomerie & North (1965) reported that 41%, Fairley (1977) 35%, Hede (1969) 23%, Brooks & Maudar (1972) 34% of subjects were US sufferers. According to Waters (1969) about 50% of those women with cystitis symptoms actually seek medical attention. Since subjects for this study were mainly acquired through medical practitioners, it is possible that the results have been biased. Cystitis sufferers who do not seek medical attention may have psychological characteristics that differ from those of people who do. The medical practitioners involved in this research also indicated that high stress levels, low educational levels, difficulty with language, concerns regarding privacy and disinterest may have influenced some women not to participate. It is unknown to what extent data from those who refused to participate may have influenced the results.

6.7 CONCLUSION

The non-specificity theory of Selye regarding the connection between stress and illness may be supported

by the results for both UTI and US groups. Both groups had higher SLE distress scores than those for the normative sample. However, since the data was retrospective, it is not certain whether higher stress levels are a cause or consequence of the illness.

The specificity theory of illness which investigates specific psychological, social, biological and environmental characteristics which predispose to particular illness. Even though the two groups were able to be statistically differentiated on the basis of measures of anxiety, anger and depression, the differences may not be clinically significant. For example, the US group subjects scored higher for trait anxiety than the UTI group however the US group subjects' mean trait anxiety score was very similar to the mean score for Spielberger's (1980) normative samples. The mean trait anger score for US group subjects was lower than that for UTI subjects and the normative sample however it is difficult to assess the practical significance of the three points' difference between the groups' mean scores. It is also not certain whether lower trait anger scores indicate repression of anger which has previously been associated with an increased probability of developing cancer. Depression scores for the US group subjects were higher than for UTI subjects however when compared with Beck's (1967) interpretation of the meaning of the scores, both groups' depression scores were within the range considered 'normal' and not indicative of clinical

depression.

The essence of the model utilised in this study (see Chapter 3) indicates that stressors (eg stressful life events) may lead to danger cognitions which in turn may arouse emotional states such as anger , anxiety and depression. Such emotional responses may in turn interact with constitutional and physiological predisposition to contribute to the development of a somatic disorder. The recurrent presence of an illness may in turn enhance the probability of encountering stressors, experiencing emotions and danger cognitions and changing physiological responses to stress.

It is difficult to assess how the model may be more or less applicable to UTI or US group subjects. In comparison with one another, the US group has higher SLE distress, trait anxiety and depression scores, while the UTI group has higher frequency, trait anger and state anxiety scores. For both groups, these factors may interact with the physiological tendency to cystitis to facilitate recurrence. It is also possible that the tendency to experience cystitis recurrently may increase the likelihood of encountering SLE's and affect emotional states. However for both groups, the emotional variables do not appear greatly different to the mean scores for normative samples and in some instances are lower. This is interesting in the light of the abundance of literature correlating emotional states with the presence of illness. It may be that other variables such as coping

resources, social support, locus of control, if measured may have given some insights into the reason for the relatively 'normal' measures of emotional states.

The findings support Engel's (1962) suggestion that "the term 'psychosomatic disorders' is misleading since it implies a special class of disorders of psychogenic etiology and by inference, therefore, the absence of psychosomatic interface in other diseases"(p.6), since both groups of UTI and US sufferers appear to have psychological factors implicated. The notion of the inadequacy of single cause formulations of illness is also highlighted since it is apparent that the tendency to experience recurrences of cystitis symptoms and sexual intercourse are not in themselves sufficient as etiological factors in this illness. It is necessary however to investigate what other psycho-social characteristics apart from stress, anger, depression, anxiety may help differentiate these groups, or between all cystitis sufferers and people with other illnesses or good health. It may also be necessary to investigate individual differences amongst cystitis sufferers rather than attempt to simplistically identify differences between two groups of cystitis sufferers.

Since this disorder is recurrent, when observing sufferers, it is not possible to say to what extent stress and psychological factors are a cause, a consequence or a simple correlate of the disease process. It will be

necessary to create longitudinal and predictive studies utilising women who have never experienced cystitis symptoms and those who have just experienced their first episode to determine which variables may predispose women to it onset and recurrence and influence its severity.

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APPENDIX 1

EPIDEMIOLOGY OF URINARY TRACT INFECTION

UTI's have been reported in all age groups (Kunin,1976). A prevalence of between 1 and 3% for the neonate has been found (Abbott, 1972) although such data may be unreliable due to the problems inherent in the collection of uncontaminated urine specimens at this age. Forty-five % of female and 7% of male infants with UTI are found to have urinary tract abnormalities, which predispose to infection (Ginsberg & McCracken, 1982). UTI affects females more frequently than males during the pre-school years (Kunin,1970), and while schoolboys infrequently experience bacteriuria, Kunin (1979) and Neu (1983) have firmly established that between 4 and 5% of schoolgirls experience bacteriuria before puberty. About 10 to 30% of these subsequently develop symptoms of UTI.

After about the age of 10 the majority of infections are experienced by women. Smith (1982) observes that "this high incidence appears to be related to the short urethra of the woman, which often harbours urinary pathogens which migrate from the perineum to the vaginal vestibule" (p.145). The higher incidence of UTI amongst women is also noted to coincide with the years of sexual activity. The trauma of coitus is another factor which renders women more susceptible to bacterial invasion of the bladder and urethra

(Robbins, 1974). It has been demonstrated that symptomatic bacteria is 12.8 times more common in early adult females than it is in nuns of the same age (Kunin & McCormack, 1968).

Studies have reported prevalences of about 20% of women between 20 and 64 years experiencing symptoms and 10% reporting more than one episode in the past 12 months (Waters, 1969). Other research by Logan & Cushion (1958), Loudon & Greenhaigh (1962), Fry, Dillane, Joiner & Williams (1962) and Mond, Percival, Williams & Brumfitt (1965) reported prevalences that were considerably lower. In Waters (1969) about 50% of those who reported symptoms consulted a doctor for medical advice. The young sufferer was more likely to seek such attention. Many previous studies have been based on those seeking medical treatment and the diagnostic criteria of positive bacterial urine culture. The data suggests that the apparent peak in incidence of UTI's in women in the 20 year age group and subsequent decline may not reflect a true decrease in incidence, but rather that younger females with symptoms of dysuria seek medical advice more frequently than do older women (p.485). There was no relationship between age and prevalence. Significantly more married women than those never married had had dysuria. There was no data revealing the numbers of unmarried women engaging in regular sexual activity who had had dysuria. Parity did not appear to be related to symptom frequency. Kass (1965) found that there appeared to be a relationship between prevalence of bacteriuria and parity only when parity exceeded 7.

If infection occurs in males before the age of 50 years it is usually related to catheterisation, cystoscopy, stasis of the urine in the bladder, prostate or kidney infection (Smith, 1978, p.165). Over the age of 65 years the incidence of UTI in the population is as high as 30% (Lye, 1978). Increasing age appears to be associated with increased risk independent of sexual activity and parity (Asscher, 1976).

Both Asscher (1976) and Rocha (1972) have concluded that race has no significant influence on UTI prevalence. Bailey (1973) however, has noted a high rate amongst Maori women. Kass (1966) states that his studies have shown that the prevalence of asymptomatic bacteriuria is independent of race and geographic location. More research is required before any generalisations may be made in this area.

ACUTE CYSTITIS

Acute cystitis usually resolves itself spontaneously or after treatment with antibiotics. Urinalysis reveals pus cells and bacteria and there is a marked elevation of white blood cells. The most common method of entry for the bacteria is ascent via the urethra to the bladder from the vulvo-vaginal area. The urethral meatus and periurethral area may be colonised by bacteria from the faecal stream which can migrate across the perineum, colonise the entrance to the vagina and move from there to the urethra.

A variety of possible causes of abacterial

cystitis have been suggested including chronic urethritis with inflammation, infection confined to the urethra and surrounding glands, oestrogen deficiency, distal and proximal mechanical obstruction, functional obstruction, urethral spasm, intermittent bacteriuria, infection by lesser known pathogens, allergies, neurologic abnormalities, trauma, chemical irritation, vitamin deficiencies and psychological factors (Scotti & Ostergard, 1984, p.515).

According to research, between 23 and 40% of patients with symptoms of dysuria and frequency show a negative urine culture (Gallagher, Montgomerie & North, 1965; Steensberg, Bartels, Bay-Nielson, fanoe & Hede, 1969; Fairley, 1971; Brooks & Maudar, 1972). Gallagher, Montgomerie & North (1965) found that US sufferers experienced to a large degree similar symptoms to UTI sufferers including fever, dysuria, haematuria, frequency, loin pain, lower abdominal pain and pyuria.

Cattell, Brooks, McSherry, Northeast & O'Grady (1975) cited by Sussman & Asscher (1979) "found that careful history taking from patients with the urethral syndrome reveals that only half of the patients complain of both frequency and dysuria, the remainder complain of frequency alone or more rarely dysuria alone" (p.416).

TABLE 9: SYMPTOMS EXPERIENCED BY UTI AND US PATIENTS

SYMPTOM	UTI (%)	US (%)
fever	36	15
dysuria	92	72
haematuria	23	13
frequency	91	94
loin pain	34	32
lower abdominal pain	64	64
significant pyuria	13	13

(Gallagher, Montgomerie & North, 1965)

APPENDIX

2

URINARY TRACT SYMPTOMS

Subjects were requested to indicate the symptoms experienced with the present episode of cystitis. The results are listed in Table 10.

TABLE 10. SYMPTOMS EXPERIENCED DURING THE CURRENT CYSTITIS EPISODE.

Symptom	% UTI Group	% US Group
1.Frequency of urination	93.75	94.12
2.Burning	71.88	70.59
3.Lower abdominal discomfort	62.50	70.59
4.Pain before urination	37.50	52.94
5.Pain during urination	43.75	52.94
6.Pain after urination	71.88	52.94
7.Kidney pain	37.50	17.65
8.Lower back pain	43.75	41.18
9.Blood in urine	37.50	29.41

Chi-square analyses revealed no significant differences between the two groups for any of the 9 symptoms. Both groups of subjects were also asked whether they suffered the same symptoms with each episode. The results revealed

that 68.75% of the UTI Group and 82.35% of the US Group experienced the same symptoms with this episode as they had in previous episodes. A Chi-square analysis showed no significant difference between the two groups (Chi-square = 1.054, d.f. = 1). The results support the findings of Gallagher , Montgomerie & North's (1965) study which revealed that UTI and US groups suffered similar symptoms.

TABLE 11. MEDICAL PROCEDURES EXPERIENCED BY THE UTI AND US GROUPS.

Medical Procedures	% UTI Group	% US Group
1. IVP	65.63	58.82
2.Cystoscopy	21.88	52.94
3.Urethral dilatation	15.62	35.29
4.Catheterisation	28.12	17.65
5.Micturating Cystogram	15.62	17.65
6.Cauterisation	6.25	23.53
7.Suprapubic drainage	6.25	5.88
8.Urethroplasty	0	0

The only significant difference between the 2 groups was found for the cystoscopy procedure (Chi-square = 4.872, d.f. = 1). US group subjects were more likely to have undergone this procedure than were UTI group subjects.

TABLE 12. MEDICAL DISORDERS EXPERIENCED BY UTI AND US GROUP SUBJECTS.

Medical Disorders	% UTI Group	% US Group
1.Vaginitis	43.75	41.18
2.Thrush	81.25	52.94
3.Vaginismus	0	0
4.Dyspareunia	18.75	35.29
5.Vulvitis	28.12	35.29

The only significant difference between the two groups was discovered for the disorder of "thrush". UTI subjects were significantly more likely to have experienced thrush than the US group subjects. (Chi-square = 4.360, d.f.=1).

FREQUENCY OF URINATION

Frequency of urination at times when cystitis symptoms were not present was reported by 70.59% of US group subjects and 31.25% of UTI group subjects. The difference between the two groups was significant (Chi-square = 6.994, d.f. = 1). US group subjects were significantly more likely to experience urinary frequency at times other than during a cystitis episode than were UTI subjects. Of those subjects who experienced this urinary frequency, 75% of US subjects and 10% of UTI subjects reported experiencing urinary frequency "quite a bit". US subjects were also significantly more likely to experience urinary frequency when excited or

upset (Chi-square = 5.074, d.f. = 1). Table 13 indicates the estimated amount of time that subjects experienced frequency in response to excitement or upset.

TABLE 13. OCCURRENCE OF FREQUENCY IN RESPONSE TO EXCITEMENT OR UPSET

Occurrence	% UTI Group	% US Group
1. every time	0	5.88
2. most of the time	6.25	11.76
3. half of the time	0	17.65
4. some of the time	25	29.41

There was an overall statistically significant difference between the two groups (Chi-square = 10.199, d.f. = 4), however these results should be interpreted with caution since the small numbers in some cells indicates that the mean for this data will not have a normal distribution.

APPENDIX 3

"THE CYSTITIS QUESTIONNAIRE".



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PSYCHOLOGY DEPARTMENT

NOTES ON THE RESEARCH

This study should be of practical usefulness to women experiencing cystitis symptoms. It will give sufferers, practitioners and psychologists objective information concerning factors that may be significant in precipitating the onset of cystitis symptoms. Perhaps if the study was introduced in these terms, women would be encouraged to participate.

The study investigates similarities and differences between groups suffering recurrent episodes of UTI and the Urethral Syndrome (i.e. people experiencing all the symptoms of UTI but without significant bacteria present in the urine) and looks for connections between stress, emotions, sexual activity and cystitis symptoms in both groups.

The subjects required for the study are females between the ages of 14 and 60 years. Their cystitis symptoms may or may not be correlated with the presence of bacteria in the urine sample (according to acceptable laboratory tests). For the purpose of the study recurrent cystitis is defined as "at least two episodes/year over the last two years" or "at least one episode /year for the last five years" If there are any problems deciding whether a patient is a recurrent sufferer or not, then they could complete the questionnaire anyway and a decision whether or not to include them in the final data analysis could be made by me at a later date. Practitioners would need to ensure that cystitis symptoms were not the consequence of urogenital abnormalities.

Could practitioners please ensure that as far as is possible procedures to prevent contamination are followed in the collection of urine samples.

If the urine specimen is contaminated, making reliable diagnosis of presence or absence of infection impossible or difficult then that subject will be excluded from the study unless another specimen can be taken before either antibiotics are given or symptoms abate, that clearly shows the presence of bacteria. If for some reason the client's urine specimen cannot be tested at the laboratory and a less reliable diagnostic procedure is utilised in the surgery, then again that subject will be excluded from the study since I need to be as certain as possible that the diagnosis is clearly UTI or Urethral Syndrome.

Could you please keep a record of the total number of women you ask to participate in the study and the number who refuse. I will contact you at the end of the study for that information. The study will continue until I have the number of subjects required for the data analysis.

Yours sincerely,
Jackie Elphinstone



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To the Participant,

My name is Jackie Elphinstone. I am currently a second year student in the Master of Clinical Psychology degree course at the A.N.U. Clinical Psychology Department. Thankyou for participating in this project.

This study should be of practical usefulness to women experiencing cystitis symptoms. It will give us objective information concerning factors that may be significant in precipitating the onset of cystitis. It investigates similarities and differences between groups suffering from urinary tract infection (UTI) and the urethral syndrome (a condition characterised by all the symptoms of UTI but without significant bacteria in the urine).

The questionnaire should be filled out by you before you hear about the results of the pathology tests (except , of course, for those questions asking specifically for the results of the tests). If you would like (and I would prefer this) I can go through the questionnaire with you and answer any questions you may have about the project. All that would require is a phone call to me. You can contact me at the university during the day on Mondays, Tuesdays and Fridays on 494003 or leave a message with the departmental secretaries on 492795. Sydney residents should contact Karen Hennig on 6641765.

The envelope containing the questionnaire is stamped and addressed so once you have answered all the questions all you are required to do is to mail the envelope and questionnaire to me. Please make sure you have fully answered all the questions since there will be no way for me to get in touch with you if any mistakes have been made. If you are interested in receiving a report on the study then please include your name and address with your questionnaire.

Thankyou for your help,

Jackie Elphinstone.

THE AUSTRALIAN NATIONAL UNIVERSITY

DEPARTMENT OF PSYCHOLOGY

CYSTITIS QUESTIONNAIRE

Confidential

April 1986

BACKGROUND INFORMATION

(All information will be kept in STRICTEST CONFIDENCE)

1. AGE years

2. Current marital status (circle one number)

Single

Married

Never married1

Once5

Divorced2

More than once6

Separated3

De Facto7

Widowed4

3. How many children do you have?

..... children

4. Please list the total number of years of schooling (primary, high school & tertiary) that you completed

..... years

Highest degree or diploma completed (circle one number)

Intermediate certificate or equivalent1

Leaving certificate or HSC2

Diploma3

Bachelor's Degree4

Master's Degree5

Doctorate6

Other7

Please specify other

6. OCCUPATION

code []

7. Regarding your current job, what is your main job level or designation?

Please be detailed, e.g. Engineer Class 4

.....

8. What is your country of birth?

.....

HEALTH INFORMATION

The following questions are concerned with your past medical history and are specifically related to the GENITOURINARY TRACT. Please think carefully about the answers you give as they are very important.

1.(a) Is there any history of kidney or bladder disease in your family i.e. mother, father, brother, sister? Circle one number

Yes1 (if yes, go to part b)

No2 (if no, go to 2)

(b) What disease(s)? Circle all appropriate numbers

Was the disease suffered by your mother, father, brother, sister?
Please code the appropriate letter(s)

		MOTHER	FATHER	BROTHER	SISTER
Nephritis	....1	A	B	C	D
Calculi (kidney or bladder stones)	....2	A	B	C	D
Cystitis	....3	A	B	C	D
Pyelonephritis	....4	A	B	C	D
Congenital (birth abnormalities)	....5	A	B	C	D
Incontinence (involuntary loss of urine)	....6	A	B	C	D
Enuresis (bed wetting)	....7	A	B	C	D
Tumour	....8	A	B	C	D
Other	....9	A	B	C	D
Don't know	....10	A	B	C	D

If the particular disease the family member(s) suffered from is not mentioned and you can remember its name then please state what it is

.....

2. Is this your first cystitis attack? Circle one number
- Yes1 (if yes, go to 6)
- No2 (if no, go to 3)
3. How long ago was your first cystitis attack? Circle one number
- Less than 1 month ago1
- Between 1 & 6 months ago2
- Between 6 months & 2 years ago3
- Between 2 years & 5 years ago4
- More than 5 years ago5
4. How many attacks have you had since then?
Please be as accurate as possible
- attacks
- If you can only give an approximate answer please indicate by circling the appropriate number.
- Approximate1
- Accurate2
5. During the time since the first attack have you ever undergone any of the following medical procedures? Please circle the number(s)
- Radioisotope renogram or intravenous pyelogram
(kidney X-ray)1
- Cystoscopy (direct observation of the bladder
& urethra under general anaesthetic)2
- Urethral dilation (mechanical stretching of the
urethral walls)3
- Catheterisation (to drain bladder, take urine samples)4
- Micturating cystogram (X-ray of process of urination)5
- Cauterisation (use of an electric instrument that
burns to excise infected areas)6
- Suprapubic drainage (when the point of entry of the
catheter is the lower abdominal wall)7
- Urethroplasty (cutting out of blockages
& reconstruction of the urethra using nearby tissue)8

6. Have you ever suffered from any of the following?
Circle the appropriate number(s)

Vaginitis (may involve vaginal inflammation, itching & discharge)	....1
Thrush	....2
Vaginismus (spasm of the vagina)	....3
Dyspareunia (painful or difficult intercourse)	....4
Vulvitis (swelling, reddening, burning, itching of the lips of the vagina)	....5

THE FOLLOWING QUESTIONS ARE RELEVANT TO YOUR
PRESENT MEDICAL STATUS:

- 1.(a) Could you describe the symptoms of your present attack? Which of the following symptoms do you experience? Circle the appropriate number(s)

Frequency of urination	....1	Kidney pain	....7
Burning	....2	Lower back pain	....8
Lower abdominal discomfort	....3	Blood in the urine	....9
Pain before urination	....4		
Pain during urination	....5		
Pain after urination	....6		

- 1.(b) If you experience any other symptoms apart from those mentioned in part (a) of this question, could you please describe them.

- 2.(a) Are those symptoms the same that you experience with each attack?
Circle one number

Yes1 (if yes, go to 3)

No2 (if no, go to b)

- (b) If the symptoms have been different in the past how would you describe previous symptoms?

3. What kind of treatment are you receiving presently for cystitis? If it is a combination of treatments then please describe each one.

- 4.(a) Do you presently use any medication apart from that for cystitis?
Circle one number

Yes1 (if yes, go to b)

No2 (if no, go to 5)

- (b) What is the medication and what are you taking it for?

- 5.(a) Have you ever been bothered by frequency of urination when you were not experiencing a cystitis attack? Circle the number

Yes1 (if yes, complete b, c, & d)

No2 (if no, go to 6)

- (b) How often? Every few days1

Less often2

- (c) Does it bother you? Quite a bit1

Just a little2

- (d) Have you ever experienced urinary frequency when you are excited or upset about something?

Yes1 (if yes, go to e)

No2 (if no, go to 6)

- (e) How often? Every time 1
 Most of the time 2
 Half of the time 3
 Some of the time 4

6.(a) Do you suffer from allergies?

Yes 1 (if yes, go to b & c)

No 2 (if no, go to 7)

(b) If you know, what are you allergic to?

(c) What symptoms do you experience?

7. Are you using contraceptives? Circle one number

Yes 1 (if yes, go to a)

No 2

(a) What kind of contraceptive(s) do you employ?
 Circle the appropriate number(s)

Pill 1

IUD 2

Diaphragm 3

Condom 4

Spermicidal Gel/Cream 5

Rhythm method 6

Other 7

If 'other' please specify

(b) Please indicate next to each of the contraceptives utilised the letter (according to the code below) representing the degree of regularity of use

Continually A

Most of the time B

Half of the time C

Some of the time D

SELF ANALYSIS QUESTIONNAIRE (SPI)
PART 1

Directions: A number of statements that people use to describe themselves are given below. Read each statement and then circle the appropriate number on the answer sheet to indicate how you feel right now. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

Directions for marking answer sheet

- . Use a lead pencil to circle the appropriate number
- . Make each circle heavy & black
- . Erase clearly any answer you wish to change. Make no stray marks.

Example Response

3. I feel curious	1	2	③	4
	NOT AT ALL SOMEWHAT MODERATELY VERY MUCH			
1. I feel calm	1	2	3	4
2. I am furious	1	2	3	4
3. I am tense	1	2	3	4
4. I feel like banging on the table	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel angry	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel like yelling at somebody	1	2	3	4
9. I feel nervous	1	2	3	4
10. I feel like breaking things	1	2	3	4
11. I am jittery	1	2	3	4
12. I am mad	1	2	3	4
13. I am relaxed	1	2	3	4
14. I feel irritated	1	2	3	4
15. I am worried	1	2	3	4
16. I feel like hitting someone	1	2	3	4
17. I feel steady	1	2	3	4
18. I am burned up	1	2	3	4
19. I feel frightened	1	2	3	4
20. I feel like swearing	1	2	3	4

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY! Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

1. 0 I do not feel sad.
1 I feel sad.
2 I am sad all the time and I can't snap out of it.
3 I am so sad or unhappy that I can't stand it.
2. 0 I am not particularly discouraged about the future.
1 I feel discouraged about the future.
2 I feel I have nothing to look forward to
3 I feel that the future is hopeless and that things cannot improve.
3. 0 I do not feel like a failure.
1 I feel I have failed more than the average person.
2 As I look back on my life, all I can see is a lot of failures.
3 I feel I am a complete failure as a person.
4. 0 I get as much satisfaction out of things as I used to.
1 I don't enjoy things the way I used to.
2 I don't get real satisfaction out of anything anymore.
3 I am dissatisfied or bored with everything.
5. 0 I don't feel particularly guilty.
1 I feel guilty a good part of the time.
2 I feel quite guilty most of the time.
3 I feel guilty all of the time.
6. 0 I don't feel I am being punished.
1 I feel I may be punished.
2 I expect to be punished.
3 I feel I am being punished.
7. 0 I don't feel disappointed in myself.
1 I am disappointed in myself.
2 I am disgusted with myself.
3 I hate myself.
8. 0 I don't feel I am any worse than anybody else.
1 I am critical of myself for my weaknesses or mistakes.
2 I blame myself all the time for my faults.
3 I blame myself for everything bad that happens.
9. 0 I don't have any thoughts of killing myself.
1 I have thoughts of killing myself, but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.
10. 0 I don't cry anymore than usual.
1 I cry more now than I used to.
2 I cry all the time now.
3 I used to be able to cry, but now I can't cry even though I want to.

11. 0 I am no more irritated now than I ever am.
 1 I get annoyed or irritated more easily than I used to.
 2 I feel irritated all the time now.
 3 I don't get irritated at all by the things that used to irritate me.
12. 0 I have not lost interest in other people.
 1 I am less interested in other people than I used to be.
 2 I have lost most of my interest in other people.
 3 I have lost all of my interest in other people.
13. 0 I make decisions about as well as I ever could.
 1 I put off making decisions more than I used to.
 2 I have greater difficulty in making decisions than before.
 3 I can't make decisions at all anymore.
14. 0 I don't feel I look any worse than I used to.
 1 I am worried that I am looking old or unattractive.
 2 I feel that there are permanent changes in my appearance that make me look unattractive.
 3 I believe that I look ugly.
15. 0 I can work about as well as before.
 1 It takes an extra effort to get started at doing something.
 2 I have to push myself very hard to do anything.
 3 I can't do any work at all.
16. 0 I can sleep as well as usual.
 1 I don't sleep as well as I used to.
 2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
 3 I wake up several hours earlier than I used to and cannot get back to sleep.
17. 0 I don't get more tired than usual.
 1 I get tired more easily than I used to.
 2 I get tired from doing almost anything.
 3 I am too tired to do anything.
18. 0 My appetite is no worse than usual.
 1 My appetite is not as good as it used to be.
 2 My appetite is much worse now.
 3 I have no appetite at all anymore.
19. 0 I haven't lost much weight, if any lately.
 1 I have lost more than 5 pounds. I am purposely trying to lose weight
 2 I have lost more than 10 pounds. by eating less. Yes No
 3 I have lost more than 15 pounds.
20. 0 I am no more worried about my health than usual.
 1 I am worried about physical problems such as aches and pains;
 or upset stomach; or constipation.
 2 I am very worried about physical problems and it's hard to think of much else
 3 I am so worried about my physical problems, that I cannot think
 about anything else.
21. 0 I have not noticed any recent change in my interest in sex.
 1 I am less interested in sex than I used to be.
 2 I am much less interested in sex now.
 3 I have lost interest in sex completely.

SELF ANALYSIS QUESTIONNAIRE (SPI)
PART 2

Directions: A number of statements that people have used to describe themselves are given below. Read each statement and then circle the appropriate number on the answer sheet to indicate how you generally feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

Directions for marking answer sheet

- . Use a lead pencil to circle the appropriate number
- . Make each circle heavy & black
- . Erase clearly any answer you wish to change. Make no stray marks.

ALMOST ALWAYS
OFTEN
SOMETIMES
ALMOST NEVER

1. I am a steady person 1 2 3 4
2. I am quick tempered 1 2 3 4
3. I feel satisfied with myself 1 2 3 4
4. I have a fiery temper 1 2 3 4
5. I feel nervous and restless 1 2 3 4
6. I am a hotheaded person 1 2 3 4
7. I wish I could be as happy as others seem to be 1 2 3 4
8. I get angry when I'm slowed down by others' mistakes 1 2 3 4
9. I feel like a failure 1 2 3 4
10. I feel annoyed when I am not given recognition for
doing good work 1 2 3 4
11. I get in a state of tension or turmoil as I think over
my recent concerns and interests 1 2 3 4
12. I fly off the handle 1 2 3 4
13. I feel secure 1 2 3 4
14. When I get mad, I say nasty things 1 2 3 4
15. I lack self confidence 1 2 3 4
16. It makes me furious when I am criticised in front of others 1 2 3 4
17. I feel inadequate 1 2 3 4
18. When I get frustrated, I feel like hitting someone 1 2 3 4
19. I worry too much over something that really does not matter 1 2 3 4
20. I feel infuriated when I do a good job and get a
poor evaluation 1 2 3 4

THE LIST of RECENT EXPERIENCES (LRE)

Here is a list which contains a lot of things which might happen to any person in a year. Some of them may have happened to you. Would you please read through the list very carefully, thinking back over your own life in the past 12 months, and circle all of the items which have happened to you during that time. Just a few of the items ask about things which have happened to someone close to you. We would like to know about these as well. Remember that no matter how trivial or unimportant you think any item may be, it is still of great importance for us to know about it if it has happened to you within the past 12 months. Some experiences may have started prior to the last 12 months and either have ended within the last 12 months or still be going on. These experiences should also be reported by you.

We need you to report on 5 aspects of each experience

1. Name the experience by circling the experience on the checklist.
2. Date the experience by writing the month and year in which it occurred in the relevant space on the checklist.
3. Indicate the duration of the experience. This refers to the time over which the experience took place, not the duration of the experience's effects on you but the time course of the experience itself. If the experience started more than 12 months ago please record the duration in months over the past 12 months.
4. Give a brief description of the experience, including the context in which it occurred; if it did not happen to you please say to whom it did occur

e.g. Item 3. Car accident - broken leg - 3 weeks in hospital - wife.
5. Please rate your judgment of the impact of each experience. Each of the 10 rating scales (1. Upset 2. Disrupted 3. Adjust 4. Depressed 5. Anxious 6. Angry 7. Helpless 8. Were you responsible? 9. Was someone else responsible? 10. Was it a matter of choice?) must be completed for each item.

List of Synonyms for Rating Scales

1. UPSET: how much you were personally shaken up by the event having happened, how unpleasant the experience was for you.
2. DISRUPTION: how much the day-to-day pattern of your life was disturbed, thrown out of gear, put off balance or disorganised by the event having happened; how much upheaval it caused.
3. ADJUSTMENT: how long it took, how difficult it was for you to get over, or get used to, the event; how much change or effort was required of you.
4. DEPRESSION: how sad, down in the dumps, gloomy, low in spirits, blue or weepy you were made to feel by the event having happened.

5. ANXIETY: how frightened, tense, worried, concerned, jumpy or afraid you were made to feel by the event having happened.
6. ANGER: how mad, annoyed, furious, hostile or angry you were made to feel by the event having happened.
7. HELPLESSNESS: how much you were made to feel powerless as if there was no way in which you could control your own life, as if you were at the mercy of others and there was absolutely nothing you could do, when the event happened.
- 8, 9, 10. These are questions about responsibility and ask about the degree of control which you felt you had over the event happening. No single person is usually responsible completely for an event happening ... how do you divide up the responsibility between yourself, some other person(s), and chance i.e. something which neither you nor anyone else could control, which would have happened regardless of anything else.

We have enclosed a copy of the rating scales. Each rating scale is presented on a 10 cm line between the two extremes of 'not at all' and 'very'. A cross placed somewhere on the 10 cm line for each of the 10 scales would indicate how you felt either when the event happened, or if it is an ongoing situation, how it made you feel in general. Using the enclosed rating scales as a guide we would like you to note on the List of Recent Experiences your ratings on these 10 scales of the impact of each experience you have named. Remember we need 10 ratings for each experience. If you have enough space please write the ratings next to the event description. If there is not enough space, please write the ratings on the back of the same page, but be sure to indicate the experience and its number, to which you are referring.

An example form is enclosed.

*

SAMPLE ONLY

st of Recent Experiences:
 at of the Check-List

cle experiences that have occurred during the past year.

Experience	Month and Year	Duration	Description	Rating
A. Illness, injury, accident				
you had a serious accident				1
you had a serious illness or injury				2
sudden serious illness or injury of someone close to you				3
<u>you have had a spouse with a long and serious illness</u>	<u>10/7/85</u>	<u>6 months</u>	<u>husband - gall stone attacks</u>	<u>① 10</u> <u>② 5</u> <u>③ 6</u> <u>④ 1</u> <u>⑤ 7</u> <u>⑥ 0</u> <u>⑦ 5</u> <u>⑧ 0</u> <u>⑨ 5</u> <u>⑩ 0</u>
you have had a child with a long and serious illness				5
you have had a parent with a long and serious illness				6
you had a minor illness or injury				7
you underwent change of life (menopause)				8
you were personally involved in a natural disaster				9
B. Bereavement				
your child died				10
your husband (or wife) died				11
death of close family member friend ...				12
C. Pregnancy or childbirth				
you became pregnant (wanted unwanted)				13
self (or wife) had baby				14
you (or wife) had an abortion or miscarriage				15
you (or wife) had a still-birth				16
you adopted a child				17
D. Changes in relationships				
you became engaged or started a new relationship				18
you were married				19
you got together again after separation due to marital difficulties				20
there was marked improvement in your relationship with husband (or wife) ..				21
<u>there was improvement in the way you get on with someone else</u>	<u>5/1/86</u>	<u>4 weeks</u>	<u>made up with next door neighbour after series of fights</u>	<u>① 0</u> <u>② 7</u> <u>③ 9</u> <u>④ 0</u> <u>⑤ 3</u> <u>⑥ 0</u> <u>⑦ 2</u> <u>⑧ 7</u> <u>⑨ 7</u> <u>⑩ 2</u>
there were increasing serious arguments with your husband (or wife)				23
there were increasing serious arguments with someone else who lives at home				24

st of Recent Experiences:
 at of the Check-List

ele experiences that have occurred during the past year.

Experience	Month and Year	Duration	Description	Rating
A. Illness, injury, accident				
you had a serious accident				1
you had a serious illness or injury				2
sudden serious illness or injury of someone close to you				3
you have had a spouse with a long and serious illness.....				4
you have had a child with a long and serious illness.....				5
you have had a parent with a long and serious illness.....				6
you had a minor illness or injury				7
you underwent change of life (menopause).....				8
you were personally involved in a natural disaster				9
B. Bereavement				
your child died				10
your husband (or wife) died.....				11
death of close family member/friend ...				12
C. Pregnancy or childbirth				
you became pregnant (wanted unwanted).....				13
self (or wife) had baby				14
you (or wife) had an abortion or miscarriage.....				15
you (or wife) had a still-birth				16
you adopted a child				17
D. Changes in relationships				
you became engaged or started a new relationship				18
you were married				19
you got together again after separation due to marital difficulties				20
there was marked improvement in your relationship with husband (or wife) ..				21
there was improvement in the way you get on with someone else				22
there were increasing serious arguments with your husband (or wife).....				23
there were increasing serious arguments with someone else who lives at home				24

Experience	Month and Year	Duration	Description	Rating
there were serious problems with a close friend, relative or neighbour not living at home	25			
you started an extra-marital affair	26			
your husband (or wife) started an affair	27			
the behaviour of one of your parents has been a problem to you	28			
the behaviour of your spouse has been a problem to you	29			
the behaviour of one of your children has been a problem to you	30			
you ended an engagement	31			
you had sexual difficulties	32			
<hr/>				
E. <i>Separation</i>				
you broke off a steady relationship	33			
you were separated from husband (or wife)—how long?	34			
you were divorced	35			
your child was engaged or married (with or without your approval)	36			
your child left home for reason other than marriage	37			
you were separated from someone else close to you	38			
<hr/>				
F. <i>Changes in living conditions</i>				
you had holidays for a week or more ..	38			
you moved to (<i>this town</i>) from overseas	40			
you moved to (<i>this town</i>) from interstate	41			
you moved house within (<i>this town</i>) ...	42			
new person came to live in your household	43			
<hr/>				
G. <i>Studying or school</i>				
you started a new course or school	44			
you changed to different course or school	45			
you dropped out of course or school ...	46			
you completed a course or school	47			
you were studying for examinations	48			
you failed an important examination ...	49			
<hr/>				
H. <i>Work situation</i>				
you were unemployed or seeking work? —how long?	50			

Experience	Month and year	Duration	Description	Rating
there was a continuing threat of your being laid off or made redundant	51			
you were downgraded or demoted at work	52			
you started a completely different type of job	53			
you were sacked or laid off	54			
your own business failed	55			
there was a big change in the people, duties, hours or responsibilities at your work	56			
you were required to work very long hours	57			
you were required to do very tedious, boring work over a long period	58			
you were required to do work over a long period which you found very difficult	59			
you were promoted	60			
there was trouble or arguments with people at work or other difficulties ..	61			
you retired or resigned	62			

I. *Financial Situation*

you have had continuous financial worry	63
you had a major financial crisis	64
you had minor financial problems	65
something you valued had been stolen or lost	66
you became much better off financially	67

J. *Legal difficulties*

you had minor difficulties with police ..	68
you had problems with the police leading to court appearance	69
you had gaol or prison sentence	70
you had a civilian suit (e.g. divorce, custody, debt)	71

K. *Disappointments*

Have there been any serious disappointments
for you in the last 12 months?

L. *Continuous worry or stress*

Have you had any other major trouble or
worry which you have had to bear
for some months or more?

Rating Scales for Recent Experiences

I.D. No. _____ Experience No. _____

1. *Upset*

Not at all upset						Very upset	
0	1	2	3	4	5	6	7 8 9 10

2. *Disturbed*

Not at all						A great deal	
0	1	2	3	4	5	6	7 8 9 10

3. *Adjusted*

None at all						A great deal	
0	1	2	3	4	5	6	7 8 9 10

4. *Depressed*

Not at all depressed						Very depressed	
0	1	2	3	4	5	6	7 8 9 10

5. *Anxious*

Not at all anxious						Very anxious	
0	1	2	3	4	5	6	7 8 9 10

6. *Angry*

Not at all angry						Very angry	
0	1	2	3	4	5	6	7 8 9 10

7. *Helpless*

Not at all helpless						Very helpless	
0	1	2	3	4	5	6	7 8 9 10

8. *Were you
responsible?*

Not at all						Mostly	
0	1	2	3	4	5	6	7 8 9 10

9. *Was someone
else
responsible?*

Not at all						Mostly	
0	1	2	3	4	5	6	7 8 9 10

10. *Was it
a matter
of chance?*

Not at all						Mostly	
0	1	2	3	4	5	6	7 8 9 10

1. How many days ago did you first notice your cystitis symptoms?

.....days (QUESTIONS 1 & 2 REFER TO THE CURRENT CYSTITIS EPISODE)

2. Did you have sexual intercourse within the 48 hours prior to the first appearance of the cystitis symptoms? (Circle one number)

Yes.....1

No.....2

If you could only give an approximate answer to the above question then please circle the appropriate number :

Approximate.....1

Accurate.....2

3. Has anyone ever suggested to you that your cystitis symptoms may be related to psychological (mental/emotional) factors ? Circle one number

Yes.....1

No.....2

4. Do you believe that psychological factors are responsible either in part or completely for your symptoms ? Circle one number

Yes, completely.....1

Yes, in part.....2

No, not at all.....3

5. What factor(s) do you think are responsible for your symptoms?

6. What is the diagnosis for this episode of cystitis ? Circle one number

Bacterial cystitis.....1

Non-bacterial cystitis.....2

7. Circle one number in response to the next question. Do you suffer from the aforementioned type of cystitis :

all of the time.....1

most of the time.....2

half of the time.....3

less than half of the time.....4

hardly at all.....5

8. If you have access to your medical records (your doctor should be able to give you this information) or if you can remember accurately, please indicate the dates of your last 6 cystitis episodes and the type of cystitis (bacterial or non-bacterial) experienced. If you can remember the type but not the dates then please indicate the types below in order of occurrence. Make No. 1 your most recent episode, No.2 your second most recent episode, etc. If you have not had 6 episodes then give the dates and cystitis types for the episodes you have had.

<u>Number</u>	<u>Date</u>	<u>Type</u>
1
2
3
4
5
6

This completes the booklet.
Thankyou for your help.
Please place the entire
booklet into the stamped
envelope and return it to
us as soon as possible.

xxxxxxxxxxxxxxxxxxxxxxxxxxxx

If you would prefer it, I can get the information relevant to the last question on the questionnaire from your doctor. You will however need to sign this form indicating that you have given me permission to ask your doctor for information concerning the date , frequency , and type of your cystitis episodes.

Thankyou.

SIGNATURE : _____

NAME _____

ADDRESS _____

DOCTOR _____

"LIST OF RECENT EXPERIENCES : REPORTED FREQUENCIES AND
DISTRESS WEIGHTS".

APPENDIX IV

List of Recent Experiences: Reported Frequencies and Distress Weights

List of Recent Experiences used, together with total reported frequency of each item and distress weight calculated for each item.

List of Recent Experiences	Frequency	Distress
<i>A. Illness, injury, accident</i>		
1. You had a serious accident.	19	24
2. You had a serious illness or injury.	39	23
3. Sudden serious illness or injury of someone close to you.	108	23
4. You have had a spouse with a long and serious illness.	9	35
5. You have had a child with a long and serious illness.	11	25
6. You have had a parent with a long and serious illness.	12	26
7. You had a minor illness or injury.	214	11
8. You underwent change of life (menopause).	10	6
9. You were personally involved in a natural disaster.	5	15
<i>B. Bereavement</i>		
10. Your child died.	4	78
11. Your husband (or wife) died.	1	82
12. Death of close family member/friend.	144	26
<i>C. Pregnancy or childbirth</i>		
13. You became pregnant (wanted/unwanted).	33	9
14. Self (or wife) had baby.	27	7
15. You (or wife) had an abortion or miscarriage.	4	29
16. You (or wife) had a still-birth.	0	—
17. You adopted a child.	0	—

(Henderson, Byrne, Duncan-Jones, 1981, p.231-234)

List of Recent Experiences	Frequency	Distress
<i>D. Changes in relationships</i>		
18. You became engaged or started a new relationship.	62	6
19. You were married.	22	4
20. You got together again after separation due to marital difficulties.	3	8
21. There was marked improvement in your relationship with husband (or wife).	57	3
22. There was improvement in the way you get on with someone else.	122	3
23. There were increasing serious arguments with your husband (or wife).	24	29
24. There were increasing serious arguments with someone else who lives at home.	21	18
25. There were serious problems with a close friend, relative or neighbour not living at home.	46	24
26. You started an extra-marital affair.	4	16
27. Your husband (or wife) started an affair.	6	34
28. The behaviour of one of your parents has been a problem to you.	26	22
29. The behaviour of your spouse has been a problem to you.	10	24
30. The behaviour of one of your children has been a problem to you.	32	21
31. You ended an engagement.	3	28
32. You had sexual difficulties.	14	28
<i>E. Separation</i>		
33. You broke off a steady relationship.	19	20
34. You were separated from husband (or wife).	20	30
35. You were divorced.	3	46
36. Your child was engaged or married (with or without approval).	24	9
37. Your child left home for reason other than marriage.	24	13
38. You were separated from someone else close to you.	37	30

List of Recent Experiences	Frequency	Distress
<i>F. Changes in living conditions</i>		
39. You had holidays for a week or more.	600	3
40. You moved to (<i>this town</i>) from overseas.	18	15
41. You moved to (<i>this town</i>) from interstate.	40	11
42. You moved house within (<i>this town</i>)	116	5
43. New person came to live in your household.	95	7
<i>G. Studying or school</i>		
44. You started a new course or school.	86	3
45. You changed to different course or school.	5	4
46. You dropped out of course or school.	26	9
47. You completed a course or school.	38	0
48. You were studying for examinations.	68	9
49. You failed an important examination.	10	17
<i>H. Work situation</i>		
50. You were unemployed or seeking work.	58	20
51. There was a continuing threat of your being laid off or made redundant.	19	30
52. You were downgraded or demoted at work.	9	18
53. You started a completely different type of job.	117	6
54. You were sacked or laid off.	7	27
55. Your own business failed.	5	34
56. There was a big change in the people, duties, hours or responsibilities at your work.	108	13
57. You were required to work very long hours.	34	12
58. You were required to do very tedious or boring work over a long period.	32	27
59. You were required to do work over a long period which you found very difficult.	12	21
60. You were promoted.	85	3
61. There was trouble or arguments with people at work or other difficulties.	64	14
62. You retired or resigned.	44	4

List of Recent Experiences	Frequency	Distress
<i>I. Financial situation</i>		
63. You have had continuous financial worry.	20	30
64. You had a major financial crisis.	15	37
65. You had minor financial problems.	123	17
66. Something you valued had been stolen or lost.	25	16
67. You became much better off financially.	107	2
<i>J. Legal difficulties</i>		
68. You had minor difficulties with police.	41	1
69. You had problems with police leading to court appearance.	15	13
70. You had gaol or prison sentence.	1	59
71. You had a civilian suit (e.g. divorce, custody, debt).	16	24

Note. The headings for the various categories of recent experiences appearing in this list are referred to in the text (Chapters 4 and 5) and in Appendixes V and VI as categories A to L. These categories may be labelled as follows:

- | | |
|---------------------------------|-------------------------------|
| A. Illness, injury, accident | G. Studying or school |
| B. Bereavement | H. Work situation |
| C. Pregnancy or childbirth | I. Financial situation |
| D. Changes in relationships | J. Legal difficulties |
| E. Separation | K. Disappointments |
| F. Changes in living conditions | L. Continuous worry or stress |

The heading "Frequency" refers to the total number of experiences of a particular kind reported by all 756 respondents in the study.

The term "Distress" refers to the weighting calculated to represent the average distress caused by the occurrence of particular life experiences. The method for deriving these distress weights may be found on pp.67-69 of the text.

APPENDIX 5

"GUIDE NOTES FOR LIST OF RECENT EXPERIENCES".

(Henderson, Byrne & Duncan-Jones, 1981, p.235 - 242)

The list you make should be as complete as possible.

The *second* task is to *date* the listed experiences by obtaining the *month and year* in which they occurred or began.

The *third* task is to find out *how long it lasted* (i.e. the experience itself, *not* its effects), if this is greater than one month.

N.B. *acute* event—duration < 1 month

chronic situation—duration > 1 month

The *fourth* task is to obtain a brief *description* of the experience, including the context in which it occurred; and if it was not to the Respondent, then the person to whom it occurred.

The *fifth* task is to obtain ratings reflecting the Respondent's judgements of the impact of each nominated experience.

These tasks will be discussed in greater detail shortly.

The following examples of the 5 forms which recent experiences might take could be useful to you:

1. An *acute* event: item 10 "your child died" is an example of an easily dated event.
2. A *chronic* situation (date of onset in last 12 months, and still going on): item 5 "you have had a child with a long and serious illness" is an example which may have begun 7 months ago and is still continuing.
3. A *chronic* situation (date of onset in last 12 months, but now over): item 5 would again be an example, if the child had a long and serious illness in the last 12 months, but now was cured.
4. A *chronic* situation (date of onset prior to last 12 months, but still going on): item 63 "you have had continuous financial worry"; e.g. as in the case of taking out a large mortgage 2 years ago and having continuous difficulty in keeping up the payments since then.
5. A *chronic* situation (date of onset prior to last 12 months, continuing into last 12 months, but now over): again item 63 would be an example if the Respondent purchased a car 2 years ago, and had difficulty maintaining hire-purchase payments, but had now succeeded in paying the vehicle off.

The issue of *duplication* of items is one that will almost certainly arise at some stage in the survey. This is where the Respondent lists 2 or more items which are not completely independent of each other. Duplication may take one of the following forms:

1. Multiple listing of the same item; for example, item 39 "you had holidays for a week or more". So long as separate dates can be given for each listed occurrence of the item, then each should be

treated as a separate and independent item for all parts of the interview.

2. Listing of several items, some of which may simply represent minor variations of a single, central item. An example might occur in items 56, 57 and 58, where item 57 "you were required to work very long hours" and item 58 "you were required to do very tedious or boring work over a long period" are simply variations of item 56, "there was a big change in the people, duties, hours or responsibilities at your work". Another example might occur in items 27 and 29, where item 29 "the behaviour of your spouse has been a problem to you" simply reflects item 27 "your husband (or wife) started an affair". Care must be exercised in these circumstances since what at first looks like duplication may not turn out to be, on further enquiry. For example, the spouse's problem behaviour (item 29) may be additional to the extra-marital affair. Arbitrary decisions must not therefore be made by the interviewer, but it should be the interviewer's task to ensure that sufficient information has been obtained to make clear whether duplication has occurred or not. Where it is clear to both interviewer and Respondent that duplication has occurred, the item chosen for further enquiry should be *the one first listed*.

Where the interviewer remains unclear about whether or not duplication has occurred, the following guidelines should be followed:

- (a) At a later point in the interview, Respondents will be asked to complete rating scales for *each* nominated item (see below). Where the Respondent is unable to *separately rate two or more nominated items*, then it may be assumed that duplication has occurred, and the first nominated item only should be rated.
 - (b) Cases of possible duplication should be noted on the Questionnaire.
3. Responses elicited by the final open-ended categories "disappointments" and "continuous worry or stress" should be carefully watched since they may be duplications of previously nominated items. If duplication is suspected, the guidenotes outlined above (2) should be followed.

Presentation of the LRE

The List of Recent Experiences (LRE) section of the interview commences when you *hand the list to the Respondent*. The list is printed on both sides of

a single sheet. A more detailed version is printed in your questionnaire.¹ The LRE should be introduced as follows:

"Here is a list which contains a lot of things which might happen to *any* person in a year. Some of them may have happened to you. Would you please read through the list very carefully, thinking back over your own life in the past 12 months, and tick any (and all) of the items which have happened to you during that time. Just a few of the items ask about things which have happened to someone close to you. We would like to know about those as well. Remember that no matter how trivial or unimportant you think any item may be, it is still of great importance for us to know about it if it has happened to you within the past 12 months."

Nominating LRE items

The Respondent is then allowed to go through the LRE and indicate items he has experienced, privately and with as little prompting as possible.

Once the Respondent has checked the list, you should take it back and commence the further enquiry. Very occasionally a Respondent will not have indicated any item on the list. If this occurs you should return the list to the Respondent, asking him to go over it again, emphasizing that any item, no matter how trivial to the Respondent, is still of importance to the study. If this procedure produces no further response, then sources of disappointment and of continuous worry and stress should be enquired into. This is discussed later in these notes.

It has been found in previous work that the average Respondent reports an item frequency of between 1 and 4 in any 12-month period. It is not unusual, however, for 15 or more items to have occurred in a 12-month period. It is essential that the Respondent reports *every* listed item that he has experienced during the 12 months prior to interview, *no matter how trivial or unimportant he considers them to be*. Moreover it is important that you make each of the enquiries (about date, duration and description) for each independent item reported by a Respondent.

¹ In fact, each interviewer carried with her two documents related to the LRE. The first was a single sheet printed on both sides, and listing only the item labels (e.g. item 4 "You had a spouse with a long and serious illness"). This was handed to the Respondent for examination during the collection of these data. The second was a more detailed questionnaire which is shown in Appendix VI and which the interviewer kept to record details of each LRE item nominated by the Respondent. Details recorded for each nominated LRE item comprised the date (year and month), the duration, and any comments which the interviewer wished to make.

Dating LRE items

Each of the nominated items should be marked in your questionnaire (Appendix VI), and should now be dated with month and year of occurrence or onset. Generally, this will be a simple procedure of asking the Respondent when the experience occurred. Where the item refers to a chronic situation, dating will have to refer to the point at which the Respondent first became aware that problems were occurring. Dating may be helped in some instances by the Respondent remembering a certain month in which the troubles were particularly bad. Record the month and year the experience took place or started.

Duration refers to the amount of time over which the experience took place. *It does not refer to the duration of the experience's effect on the Respondent, but deals with the time course of the experience itself.* For some items, duration will be short. If this is *less than one month*, they can be considered to be *acute* events. In other cases, duration will be prolonged. Durations of *greater than one month* may be considered to be *chronic* situations. Duration should be noted for each item reported to have happened. If the experience started more than 12 months ago, record the duration in months during the past 12 months. Examples: item 7 "you had a minor illness or injury" will most likely have a duration of less than one month; item 8 "you underwent change of life (menopause)" will more probably be prolonged over several months.

Describing LRE items

You should note a *brief description of each item*. This should include the context within which the experience occurred, its seriousness, and if it happened to someone other than the Respondent, the person to whom it happened. Thus a description of item 3 "serious illness or injury of someone close to you" might read "car accident -- broken leg, 3 weeks in hospital -- wife".

Reviewing the checklist

The two statements on disappointments and continuous worry or stress at the end of the list, are very important. They serve to have the Respondent go back over the list and rethink his or her item choices. In particular, they have been found useful in revealing previously omitted items. They also result in the reporting of sources of stress which are not included in the list itself. For this reason it is important that these statements be properly dealt with.

1. Disappointments

The section on disappointments (section K) is dealt with by the interviewer, in a statement of the following kind:

"You have told me about those things on the list which have happened to you in the last 12 months. Is there anything on the list which you have not told me about which has caused you some disappointment in the last year?"

It is usually convenient at this point to hand back the list to the Respondent so that it may be looked through once again. The Respondent should then be asked:

"Is there anything which was *not* on the list which has caused you some disappointment in the last year?"

You should emphasize that some source of disappointment *may* have been mentioned on the list but it need not necessarily have been. The question is of necessity an open-ended one, and some interviewing skill may be required to elicit appropriate responses.

If an appropriate answer is obtained, it should be dated, the duration recorded and the event or situation described in the standard manner.

2. Continuing worry or stress

The statement relating to sources of continuing worry or stress (section L) should be dealt with in much the same way as that relating to disappointments. The Respondent is asked to report any experience not included in the LRE which, over the past year, has been a source of continuing worry or stress. It should be emphasized that certain events, situations or circumstances may be sources of continuous worry to the Respondent. These may have already occurred on the list, but not necessarily. If further continuous sources of worry are elicited by the interviewer the date, duration and description should be recorded as usual.

At this point the Respondent should be asked to go over the List of Recent Experiences once more, and should be asked whether there is anything that has not yet been mentioned which the Respondent thinks might be important.

The final task of this section is to have the Respondent complete a set of *rating scales* for each independent, nominated item. This is designed to assess the emotional impact which each experience has had on the

Respondent. It is considered necessary because of research which emphasizes the importance of personal interpretations of life experiences in the development of illness.

Ten rating scales must be completed for *each* nominated item. These are presented on one single sheet. The first 7 scales refer to the emotional consequences of the experience, while the last 3 scales refer to the source and degree of control. The scales are numbered:

1. Upset
2. Disrupt
3. Adjust
4. Depressed
5. Anxious
6. Angry
7. Helpless
8. Were you responsible?
9. Was someone else responsible?
10. Was it a matter of chance?

Each is presented on a 10 centimetre line, between the two extremes of "not at all" and "very" (or "a great deal" or "mostly").

The task is to have the Respondent place a cross somewhere on the 10 cm line for each of the 10 scales, to indicate how he felt either *when the event happened*, or if it were a continuing situation, how that situation made him feel in general. *This must be done for each of the nominated items.* The sheet of scales is *handed to the Respondent* and is self-completed.

While most people involved in the study will not experience difficulties in understanding the terms used to describe the emotional responses to life experiences, it is expected that a small number of people will require some added explanation from the interviewer.

Difficulties in interpretation of words to describe emotions or feelings may also become apparent, and some clarification from the interviewer may be considered necessary.

For these reasons a standard list of synonyms is given below to cover those emotional states which it might be expected would cause trouble.

It would appear that the concepts of *adjustment*, *depression* and *anxiety* would be open to the greatest potential lack of understanding or interpretive confusion. The others should give little trouble.

These synonyms should be used *only* where the Respondent requests further explanation or clarification of a concept, or where it is obvious to the interviewer that the Respondent is having difficulty in understanding a concept, or is clearly misinterpreting it.

1. *Upset*—This asks how much you were personally shaken up by the event having happened; how unpleasant the experience was for you.
2. *Disruption*—This asks how much the day-to-day pattern of your life was disturbed, thrown out of gear, put off balance or disorganized by the event having happened; how much upheaval it caused.
3. *Adjustment*—This asks how long it took, or how difficult it was, for you to get over, or get used to, the event; how much change or effort was required of you.
4. *Depression*—This asks how sad, down in the dumps, gloomy, low in spirits, blue or weepy you were made to feel by the event having happened.
5. *Anxiety*—This asks how frightened, tense, worried, concerned, jumpy or afraid you were made to feel by the event having happened.
6. *Anger*—This asks how mad, annoyed, furious, hostile or angry you were made to feel by the event having happened.
7. *Helplessness*—This asks how much you were made to feel powerless, as if there was no way in which you could control your own life, as if you were at the mercy of others and there was absolutely nothing you could do, when the event happened.
- 8, 9, 10. The questions about responsibility ("were you responsible?", "was someone else?", "was it a matter of chance?") ask about the degree of control which you felt you had over the event happening. No single person is usually completely responsible for an event happening; it often happens that several things together bring the event about. We therefore want to know how you divide up the responsibility between yourself, some other person, or people, and chance. By chance we mean just one of those things which would have happened regardless of anything else; something which neither you nor anyone else could control.

It is always helpful to the Respondent for the interviewer to point to the 10 cm line while explaining each scale.

Remember that a set of 10 rating scales (one sheet) *must* be completed by the Respondent for *each* nominated item.² Each page should have the Respondent's Questionnaire Number and the relevant experience number in the space provided at the top of each sheet of rating scales. Hand each sheet separately to the Respondent, for each item that is to be rated. Make a final check that *all* nominated items have been rated.

Summary

1. Obtain list of *all* experiences occurring in past 12 months.
2. Obtain *date* (month and year).
3. Ascertain *duration*.
4. Provide brief *description*.
5. Complete *rating scales*.

APPENDIX 6

LABORATORY PROCEDURE

Laboratory Procedures

Samples were stored at 4°C until examined, usually within four hours of collection. Uncentrifuged urine was examined by phase-contrast microscopy and white, red, and epithelial cells were counted in an improved Neubauer counting chamber (brightline); pyuria was defined as the presence of ten or more pus cells/mm³ in the uncentrifuged specimen. Viable counts were performed by the paper strip method⁷ on MacConkey agar (Oxoid code no. CM7) which was incubated overnight at 37°C. Significant bacteriuria was defined as a viable count of more than 100 000 organisms/ml in pure culture.

Isolates were identified according to the procedure and nomenclature recommended by Cowan⁸ and were also stored at 4°C on nutrient agar slopes. A standard method of disc sensitivity testing⁹ was employed using 'Sensitest' agar (Oxoid) and sensitivity discs (Oxoid code no. 5496S) to determine sensitivity to sulphonamide, ampicillin, nalidixic acid, and nitrofurantoin. The sensitivity of *Proteus* sp. to nitrofurantoin was not performed by the disc method because of unresolved difficulties in interpreting disc tests with this organism and nitrofurantoin.^{9 10} Quantitative sensitivities of selected isolates were also determined by the agar-plate dilution technique¹¹ on sensitest agar with a Steers multiple inoculating device using an inoculum of 10 000 organisms. Most samples of urine were tested for antibacterial activity.¹²

(Tapsall, Bell, Taylor, Smith, 1975, p. 2-3)